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# Strong Economies, Weak Polities: The archaeology of central India in the early centuries A.D.

by

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of the requirements for the degree of
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Pour Grand-mère, qui a
fait aussi des voyages

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# CHAPTER I

# INTRODUCTION

Economic activities in early complex societies can be described as being one of many forms of interaction placing individuals in face-to-face contact with other individuals. As population increases and social constructs multiply, the number of interactions from which individuals and households can choose to supply their needs also grows. The physical world serves as the basis for those interactions, especially as manifested in the material objects which people obtain, exchange and utilize. Such objects may serve in a variety of capacities, often simultaneously: daily use or ritual use, domestic use or political use, individual use or group use, where the interpretation of the social and utilitarian role of the physical world is based in the context of ongoing and often overlapping social interactions.

With the manipulation of the environment an essential component of human social behavior, goods are desirable because they symbolize the common traditions shared by groups of people, and are a material referent to communication carried out language. The desire for material goods as symbols of links across a landscape and

within social groups becomes heightened as social complexity increases, especially as new political and social constructs invite individuals to display and proclaim their multiple interconnections.

The case study offered in support of this proposal is an examination of the local and regional economic interchanges utilized by a town site of the Early Historic period in central India. In the subcontinent between the third century B.C. and the fourth century A.D., there is widespread evidence for long-distance exchange in durable goods at a time when political entities were relatively short-lived and had few resources to invest in the facilitation of exchange. Despite the lack of transportation and communication infrastructure, the communities of the subcontinent shared a material culture which demonstrates communication about style as well as the physical movement of objects. Field research was conducted at the site of Kaundinyapura and its environs, where a series of systematic surface collections was undertaken in 1994 and 1995 to document the artifacts of local trade in the Early Historic period.

Analysis of these collections demonstrate that items of common use during the Early Historic period, such as sandstone implements and micaceous vessels, were widespread at the site though the geologic source areas for these materials is at least 75 kilometers away. Environmental and ethnographic evidence from the early modern period

enables the construction of an economic model in which perishable goods, such as forest products, formed a vital aspect of the trade network in the early centuries A.D. It is proposed that trade activities flourished in this period because of a widespread need for objects which served multiple roles: objects were the visible manifestation of kinship, religious and social ties across an economically-diverse landscape, as well as being symbols expressive of hierarchical social structures within towns and villages.

The discussion of trade activities in early complex societies, with reference to this case study in central India, is structured as follows. The following chapter, Chapter Two, identifies how the exchange activities of premodern societies can be analyzed utilizing models derived from ethnographic studies of small-scale societies as well as from formal models developed to describe the economies of modern industrial nations. Since these analytical approaches both rely on twentieth-century observations, they present certain limitations in the analysis of premodern, preindustrial societies for which there is no contemporary analog. To resolve this dilemma, the two essential components of an exchange system are identified as the basis for further discussion.

The presence of only two components--communication and transportation--are proposed in Chapter Three to be the essential factors in trade activity. Information transfer is not only a critical element of the exchange process, but

also a principal impetus for exchange activity. Social symbolism is found not only in goods accorded high status, but also in the ordinary domestic goods which comprise the household repertoire. As social complexity increases, additional social markers assist in the identification of individuals as members of cross-cutting social, political, and religious groups, where goods convey information about emergent hierarchy as well as group membership. The desire for goods by all sectors of the population, and their value in social communication, is a critical factor in the development of economic activities including the production of a tradable surplus.

Following this discussion of the social value of goods, Chapters Four and Five introduce the Indian subcontinent and the geographic area of the case-study. Archaeological and historical evidence shows that trade flourished in the subcontinent in the early centuries A.D., although there was no dominant political entity to provide economic infrastructure. To investigate the role of individual trading towns, and the way in which goods were distributed within towns in this network, required the detailed assessment of a trading town in its entirety. Subsequent chapters discuss the implementation and results of a systematic archaeological survey program at the site of Kaundinyapura in central India, a program developed to collect data about economic activities.

In Chapter Six, a discussion of surface survey techniques prefaces the detailed description of the survey strategy utilized at Kaundinyapura and its environs. This survey project represents the first time that an Early Historic period site in the subcontinent has been investigated in its entirety; here, the collection strategy was designed to acquire information about the production and consumption of goods. The archaeological collections from Kaundinyapura and a smaller contemporary settlement at Dhamantri were catalogued and processed to enable the retrieval of a number of different kinds of information about production activities, the use and distribution of goods, and chronology; these strategies of analysis are discussed in Chapter Seven.

In Chapter Eight, the materials gathered through the systematic surface collections at Kaundinyapura are discussed. These materials represent a variety of consumption and production strategies in an archaeological assemblage which includes items made of ceramic, sandstone, iron, and chert. Geological investigations in the region reveal that sandstone, as well as the mica incorporated into a significant quantity of the ceramics, was not locally available and must have come from the area beyond the Deccan basalts which characterize the local geology. The presence of non-local goods at Kaundinyapura, and their distribution throughout the site, indicates that the majority of households engaged in exchange.

In preparation for a discussion of the means by which Kaundinyapura participated in the regional exchange network, Chapter Nine briefly discusses the long-term history of the region, utilizing both archaeological and historical documents to affirm that population densities in the Early Historic period were relatively low. Chapter Ten presents a comprehensive model for the production of surplus at Kaundinyapura, assessing the potential for managing surplus production from local resources including agricultural goods, forest products and locally-available chert. In this chapter, it is shown that a variety of strategies are required to successfully maintain a desired level of production; at Kaundinyapura, the perceived minimum level of "subsistence" production included the allowance for a tradable surplus to maintain social and economic ties with other sites in the region.

Chapter Eleven presents the summary of the research project, utilizing Kaundinyapura as an illustration of the way in which premodern town sites participated in exchange networks to meet local needs. By documenting that non-local goods were utilized and distributed at the site, the work at Kaundinyapura presents a succinct case-study for the way in which goods, as the essential embodiments of social communication, are a significant impetus for the development and maintenance of trade activity.

## CHAPTER II

## TRADE ACTIVITIES IN PREMODERN COMPLEX SOCIETIES

The analysis of economic activity in premodern complex societies is generated through two distinct types of observations: ethnographically-documented cases of small-scale societies, and the trade activities of modern industrial nations. Both means of examining the role and mechanics of trade stem from observations primarily made in the twentieth century; while both contemporary small-scale societies and large-scale production entities have much to offer in the way of economic insights, it is proposed that emergent complex societies known from the archaeological and historical records require additional considerations to establish coherent models of the workings of exchange during periods of social transition to greater social and political complexity.

Differential access to some specialty goods constitutes an important marker of socio-political complexity by identifying those individuals possessing decision-enforcing capacities. It has often been argued that elite goods provided the principal motivation for trade in both traditional tribal societies and at the inception of greater social complexity, though archaeological and ethnographic

studies document the long-distance transfer of large quantities of "non-elite" goods as well. The establishment and maintenance of patterns of exchange are predicated upon the both "elite" and "non-elite" goods, where the same basic mechanisms of transportation and communication are utilized in the exchange of all types of goods. Such commonalities indicated that the interpretation of the social role of goods is based on context.

## Anthropological examinations of trade activity

Two principal avenues of investigation are available for the anthropological analysis of trade: the examination of trade under conditions of small-scale social organization utilizing ethnographic research, and the examination of trade as a component of the modern nation-state. Both perspectives provide important details about the mechanics of exchange on the broad scale, and the social value of exchange and of exchange-goods for individual participants.

Formal economic models were developed within the context of early mercantile capitalism beginning in the 17th century. In these models, participation in economic activities is driven by the desire to achieve the maximum benefit with the minimum expenditure: sellers seek to maximize profits, and buyers seek to maximize utility. The institution which permits this maximization is the market, which can be defined a space where "buyers" and "sellers"

meet and where exchange parties interact either directly or through intermediaries. As in every model-building activity, the construction of formal economic models entails the use of generalizations which represent actual relations in simple form. Subsumed in these generalizations are important assumptions which merit more thorough examination. One such assumption is that individuals, both as buyers and sellers, are viewed as atomistic and rational in their maximization pursuits. The second is that the market of formal economic models is characterized as "perfect" market, in which the sole regulatory mechanism is price, and each exchange activity occurs without regard to past or future actions on the part of the transactors.

Observations of tribal societies in the early twentieth century indicated that the social aspects of trade took precedence over what might be perceived as "rational" short-term behavior. The emphasis on 'economic' man proposed by formal models was seen as limiting, because small-scale societies were perceived to be "more concerned with social, ritual, and ideological matters than with the more mundane problems of subsistence, technology and economics" (Hole 1983:14). Ethnographic studies indicate that the acquisition, as well as the use, of goods in small-scale societies is achieved in a sphere dominated by social relations, with exchange in the primitive economy evaluated for use value rather than for money value, and for the benefit of social relations rather than for

subsistence needs (Sahlins 1972).

The competition between purchaser and seller is not limited to the value of the object or service according to an abstract standard, but also involves an aspect of social competition, as Sahlins observes for the Siuai of Bougainville: there, if a big-man gives 30 units to buy a pig, "the pig owner would be ashamed to send along a pig worth less than forty" (1972:248-49). In the exchange described by Sahlins, personal contacts between buyers and sellers affect the price paid for a market item, where the "price" is negotiated beyond a standard value of worth in abstract terms.

The introduction of a personal and situation-specific element into market exchange does not mean that economic principles are invalid. Instead, the social aspects of the market are the means by which strictly economic interchanges are modified, ameliorated or augmented. Standard formal economic principles still apply, in that decisions are made by individuals about the allocation of resources towards varying goals. Individuals must decide how to use actual resources as well as potential resources, where the allocation of projected future resources can be viewed in terms of "opportunity cost" (the costs incurred when rejecting a potentially lucrative option in favor of a less-lucrative option which has other perceived benefits). Among the Siuai, production for exchange involves the allocation of time, including the loss of some perceived

"leisure" time (Sahlins 1972).

Anthropological studies of exchange in small-scale societies have indeed tended to emphasize the social aspects of that exchange. There is perceived to be a distinct division between utilitarian goods and objects which carry social and prestige value, and most studies have focused on the role of elite goods which are linked to political manipulation. In Malinowski's study of the kula-ring trade, three exchange spheres were documented: the "noble" trade of the kula, the "gimwali" trade involving non-noble commodities, and the "wasi" trade, which took place between environmental zones (Malinowski 1932[1922]).

Although the partners for all three exchange types were frequently the same, the trade of "noble" objects took precedence in the description of this elaborate social network by the investigator and subsequent commentators (Malinowski 1932[1922]; Mauss 1990[1925]; Renfrew 1975). Mauss also discusses the institution of the potlatch with reference to the preciosities consumed thereby, where precious things "are a sign and pledge of wealth" (1990[1950]:44). The investigators' biases in examining the "noble" aspects of trade in their ethnographic studies are probably due to their personal associations with high-status groups during the course of their research, where discussions of the social value of particular goods was a framework of social interaction.

The documentation of exchange activity in small-scale

societies, based on ethnographic cases which describe face-to-face interactions between individuals, presents grave limitations for the interpretation of exchange activities under conditions of greater social complexity as known through archaeologically and historically documented cases among the early states and empires. The presence of a higher population density, greater territorial expanse, and multiple and often overlapping layers of group interaction, interdependence and dominance require the development of a model which accounts for increased loci and facilitators of exchange, as well as increased quantities of goods, providers, and consumers. When an ancient society under investigation is clearly more complex than the tribal level of social organization, the analogs of trade behavior are often sought in reference to the interaction of political and economic spheres in the modern world. In the past, these discussions have polarized on the issues of whether the observations about the function and scope of the economy in modern nation-states could (Frank 1992; Schneider 1977) or could not (Krader 1992; Polanyi 1975 [1951]; Rotstein 1970) be applied to ancient economic systems.

The examination of exchange motives in anthropologically-documented case studies in the early twentieth century indicated that market-based formal economic models were inadequate to describe exchange behavior in the early civilizations. Examinations of the socially-based aspects

of exchange activities in modern small-scale societies subsequently led to the proposal that modern capitalist society had evolved into an entirely new type of economic entity. Because models derived from observations of capitalist economies were shown to be inappropriate for the analysis of small-scale societies, they were also presumed inappropriate for the precapitalist ancient economies.

As an alternative, the "substantivist" school of thought proposed that the economic organization of ancient states was not necessarily a product of market forces, where profit-seeking behavior governs the transfer of goods and services between individuals and institutions. For the substantivists, large-scale interactions are based exclusively upon the ability of centralizing entities such as religious or political institutions to requisition goods, implying an unequal relationship between producers and consumers. This point of view is most closely associated with the work of Karl Polanyi, who maintained that social mechanisms removed price-fixing markets from the realm of early institutions (Polanyi 1957). In the absence of market dominance, the production and distribution of ordinary and prestige goods is socially controlled, so that all allocations of natural resources, labor, and goods are direct expressions of political, kinship, or religious institutions (Dalton 1975:82). Trading activities between individuals appear, to Polanyi, to have been halting and discontinuous contacts, in which trade was limited to

single undertakings by persons not well-integrated into the social fabric (such as resident aliens; Polanyi 1957).

Critiques of the substantivist position take their starting-point from the reexamination of Polanyi's data. Gledhill and Larsen's analysis of advanced state models, in which they argue that some market activity can be documented in precapitalist, aboriginal states, points to some of the specific aspects of profit-seeking trade. (Gledhill and Larsen 1982). For early Mesopotamia, where Polanyi claimed that there were no markets and that trade was "risk-free", they note that at Nippur in the 18th century B.C., wealthy private merchants took advantage of disaster to gain control of land through purchase. Examples of risk-taking behavior in pursuit of profits in the market are also demonstrated at the central Anatolian outpost of Kanesh, where family firms sometimes incurred losses in trade activities (Gledhill and Larsen 1982). Clearly, elements of requisition and unequal relationships between producers and consumers exist in complex societies; the principal limitation of the substantivist school is in the view that profit-seeking behavior can be excluded from the analyses of premodern economies.

Another school of thought, which parallels the substantivist school in presuming the modern economy to be a special product of post-Renaissance social and political change, is found in the works of Immanuel Wallerstein, who proposes that the political and economic patterns visible

today constitute a "world-system". In the modern world-system, interconnected and well-organized political centers exploit colonial "peripheries" for the extraction of raw materials (Wallerstein 1974). Although Wallerstein himself held that the world-system visible today was the result of a unique set of historical European circumstances, in recent years the world-system approach has been used by others who propose that it can be used to understand ancient exchange mechanisms as well (for a summary, see Whitecotton 1992; Schneider 1977). The application of the world-systems model to premodern economies may be most successful when used to examine the relationships between the centers and peripheries of a single polity, in which the "core" areas (such as urban zones) are clearly endowed with greater civic investment and tend to rely on outlying areas for subsistence and other goods no longer produced by all of its inhabitants. The essence of world-system theory appears to require exploitation, which though it probably existed in varying quantities, can be demonstrated in the ancient world.

The application of world-systems theory does not appear to be successful in explaining the links between polities under circumstances where no polity has sufficient political or economic leverage to exploit other, subordinate polities (see, for example, the attempt to use world-systems theory to characterize the links between Mesopotamia, central Asia and the Indus valley in Lamberg-

Karlovsky 1989). Recently, examinations of economic interactions at Hacinebi, Turkey, have examined the relationships between polities when one cultural group appears to have established economic links with neighboring resource-rich areas (Stein *et al.* 1996). G. Stein and his team have excavated what appears to be an enclave of Uruk traders from the fourth millennium, but questions whether Uruk-peripheral interactions were based on exploitative, "colonial" relations of dominance (cf. Algaze 1993).

Instead, Stein and his co-authors suggest that aspects such as "the fortification wall, large-scale public architecture, and associated evidence for long-distance exchange of chlorite ornaments in Hacinebi phase A raise the possibility that the pre-contact societies of southeastern Anatolia might have been more complex than is generally recognized," meaning that it was less likely that Uruk could have exploited an underdeveloped periphery as was the case in modern colonial history (Stein *et al.* 1996:221). Even in the modern world, the "world-systems" approach appears to be most effective as a descriptive, rather than explanatory, examination of economic interactions. For the ancient world, it is a term of limited usefulness, applicable only to the internal workings of some ancient polities where there is clear evidence of a political core which can amass and direct resources towards the sustained exploitation of peripheral areas.

The presence of a variety of exchange activities documented by archaeological and historical case studies have led many scholars to acknowledge that formal economic models can neither be accepted nor rejected wholesale (Miller 1995; Plattner 1989a; Granovetter 1985; Gledhill and Larsen 1982). Both formal and substantivist evaluations provide terminology and methods of inquiry for the study of trade. Formal models have described the ideal trajectory of surplus production, with the assumption that the satisfaction of wants is accomplished through the allocation of finite resources. The substantivist critique has illustrated that the social component of economic interactions plays a considerable role in the allocation of those resources, and that "rational" decision-making is undertaken with reference to a social standards of value which are often context-specific and negotiable (see Granovetter 1985; Orlove and Rutz 1989).

Because more is known about the mechanics and elemental components of modern complex societies, there is an expanded theoretical apparatus to describe and explain economic activities. It is proposed that the examination of the development of trade activities in premodern complex societies is therefore best accomplished utilizing modern economic structures to isolate the key elements of exchange networks. The use of a modern capitalist economic landscape to discuss ancient polities may seem, at first glance, inappropriate. However, several justifications may

be offered: first, formal economic models, based upon observations of modern industrial capitalism, have also been the basis for the formulation of alternative explanatory (and progressive) explanations for economic activities. The global economic system generated in the industrial Euro-American sphere is often the base point of view of any author writing on the subject, and the impact of the modern world is inescapable. Rather than allow the biases of the mass-production, mass-consumption world-view to subtly permeate a discussion of an economic system, it is better to acknowledge, and confront, the underlying assumptions therein.

Secondly, the presence of the modern capitalist framework has engendered a detailed critique of capitalism, including a rejection of the basic tenets and values of surplus production and the alienation of workers from that production. Although most readily identified with the writings of Karl Marx, the morality of overconsumption and overproduction has been critiqued throughout the development of capitalism, beginning in the early 17th century (McKendrick 1982b). What has come to be identified as a Marxist view has been carried on through the work of both those who actively sought revolution and change (e.g., Antonio Gramsci and V.I. Lenin (Femia 1975) and those who observe and analyze contemporary developments in the production and consumption of items ranging from state-sponsored housing to trends in fashion and other consumer

goods (e.g., Preteceille and Terrail 1985). The critique of capitalism contains information about the workings of markets and the realms of production and consumption which reveal the social aspects of economic activities in the modern world.

Finally, because the development of capitalism has been extensively documented, there exists the possibility of locating turning-points in social structure which responded to, and inspired, technological or organizational change. These changes and their effects were chronicled by the people who lived through them, both in serious political tracts and in popular literature. More recently, historians of capitalism have utilized additional records such as wills and probate lists to supplement interpretations of the way in which wealth was generated and dispersed (e.g. Nenadic 1994; Fine and Leopold 1990; Leone and Potter 1988; McKendrick 1982b). This information provides the ability to winnow out the driving forces which are perhaps unique to modern-day capitalist production, and to isolate the general factors which affect and generate trade activities in large-scale populations.

## Modern economies

Rather than make a simplistic determination of whether the capitalist system describes ancient polities, or whether the particular construct of interconnected centers

visible in the modern world can adequately or correctly characterize ancient political economies, a more fruitful approach is to examine the separate assumptions incorporated in the modern world-view. Through an examination of the component parts of contemporary economic constructs, it is possible to determine which of the components and assumptions of market-based interactions can be applied to ancient economies. Formal economic models incorporate a number of conditions visible in the workings of modern nation-states, such as the presence of absolute boundaries between and within polities, fully-monetized economies, and scarcity in the market which is a product of both the natural limits of raw material supply and political constraints on exports of raw materials and finished products. A brief examination of the conditions under which modern economies flourish indicates that not all of these conditions must be fulfilled in order to have a working market system, and that market forces are predicated on relatively few political requirements.

The presence of effective boundaries in the modern world may well have been an outgrowth of the need and ability to maintain exclusive territorial rights over resources such as labor or agricultural land. As large merchant houses grew into prominence in early modern Europe, their interaction with the political hierarchy encouraged and supported the acquisition of new lands under a nationalistic banner (Braudel 1992[1979]). This resulted

in competition between emergent nation-states and the strengthening of boundaries not only between those states in Europe, but in their colonial lands abroad. In the colonial domains, the reinforcement of externally-imposed boundaries resulted in warfare between colonizing powers as well as upon indigenous groups. In fighting these wars, colonizing powers had two distinct advantages: superior weaponry and more extensive resources of credit, the latter perhaps being the more significant advantage (Gordon 1993).

Boundaries are maintained as internal divisions in modern nation-states as well. To provide themselves with revenue, centers must extract tribute from subordinate territories and fend off challenges by competing polities. Successful centralized political systems must exercise control over two forms of competition: their potential competitors for the upper ranks of the political hierarchy, and competitors for tribute and territorial control by all parts of the political hierarchy. The structure of ancient political organization at the central level provided many opportunities for the usurpation of bureaucratic roles by persons contending for political and military authority, where the competition was often played out in the territory administered by individuals. To manage the threats posed by competitors for the highest political levels, a central authority could assign individuals to territories away from their ancestral lands, keeping them from developing a power base; in addition, the territories might be divided into

non-contiguous tracts. Other tactics to reduce competition include the assignment of potential rivals to separate, non-political realms such as religious establishments. The alliances struck between smaller and larger political entities incur a continual series of negotiations as the larger entities seek greater amounts of tribute and support while the local leaders seek to lessen their burden.[1]

In modern nation-states, the continuity of leadership and the control of the center over subordinates (e.g. by force or by symbiosis) means that capital investment can be high; this capital investment is one of the principal building blocks of economic and political structure (M.E. Smith 1991). In a world where central authorities must negotiate with local leaders and fend off competitors for central authority, there was probably little opportunity for the long-term surplus extraction which would provide the upkeep for capital investments. When large-scale projects were undertaken in the ancient world, they were usually associated with a particularly successful central leadership.

The preceding discussion indicates that political

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[1]A good example is provided by Douglas and Isherwood for the period of the Hundred Years' War (Douglas and Isherwood, 1979). While many of the local lords had ties either to England or to France, these loyalties could be switched as either royal house offered a better incentive; "Between the main ranks of adversaries stood a confused crisscross of lords who sniffed the wind, weighed the risks of a change in allegiance, and passed from one camp into the other, trafficking in loyalty" (1979:34).

entities, and their component parts, are subject to a variety of stresses which require the resolution of conflict and the mitigation of cooption. The inherent strains of succession and administration, and the cost of military activities, lead to a prediction that trade could not be accomplished effectively in premodern complex societies because capital accumulation for economic investment was low. Yet, this was not the case, as there are volumes of archaeological evidence which attest to medium- and long-distance trade. In the modern realm, the effect of political stability is not limited to capital investments but is seen as being fundamentally intertwined with economic stability:

> Markets [defined as a social institution of exchanges] become regular, adequate and secure when regions are integrated economically, politically and socially. Regional integration comes from investment in infra-structure, meaning the basic technology of trans-portation and communication (Plattner 1989b:181).

Plattner goes on to elaborate upon these items of infrastructure: sufficient and reasonably priced trans-portation and transportation support networks, storage facilities, the means to transmit information about goods being traded, and political integration of regional societies. The last condition, that of political inte-gration, is needed "so that traders are not subject to exploitation by local officials when they cross local borders and so that trade is not disrupted by violence. Warfare obviously makes normal trade difficult or

impossible" (Plattner 1989b:181). These views are predicated on the types of regional entities, fixed boundaries, and all-inclusive warfare of the modern nation-state; it also assumes that traders are tied to a specific political system. The observed inseparability of the economic and political spheres in the modern world is sometimes incorporated into the very definition of trade: "...however these terms (trade, civilizations, states) are defined, they imply an organization, a specialized administration, which regulates human activities both in terms of procurement (movement of goods including raw materials) and of social relations (human encounters with exchange of information and goods)" (Renfrew 1975:4).

The assumption that strong political systems are necessary for viable exchange environments means that often, the potential complexities of an ancient economy may be neglected *a priori* due to known historical circumstances such as political instability.

**The principal components of a successful economy**

Having examined some of the assumptions which underlie formal economic models developed for Western industrial nation-states, and determined that strong political organizations are not prerequisites for trade in emergent complex societies, it remains necessary to examine the logistical components of a large-scale economy. There are

three principal logistical components: media of exchange and standards of value; transportation; and information exchange through communication.

Exchange activities can take place in three forms: requisition, barter, and the utilization of an exchange medium which serves as a standard of value between commodities of variable individual value. All three types of exchange can be attempted by groups or individuals, and all can be accomplished with either immediate or delayed reciprocity. Under the condition of requisition, unequal power relations between the exchanging parties are usually assumed; supplies such as food are channeled from producers and their intermediaries towards a consuming entity. For the provider, the return is often intangible and results simply in a maintenance of status, such as avoidance of punishment for non-compliance.

Under conditions of barter, the value of the items or services exchanged is abstracted and negotiated by the exchange parties. Barter can take place as an exchange of highly disparate commodities, such as services in exchange for physical goods. Exchange utilizing a standard of value, such as coinage, is the most well-known in the modern economy. Coinage first appeared in the Mediterranean in the sixth century B.C. and the coin form quickly became adopted throughout the Mediterranean basin and Asia Minor. Whenever standardized units of metal, usually round with struck or cast designs, appear, the

assumption is made that these ancient "coins" are equipped with all of the attributes of modern coinage: standardization of value, the universal acceptance of the coins minted by the central authority, the sanctity of the coin form, and the exclusive right of central authorities to mint coins.

Some of these assumptions result from observations of the modern world, in which "(t)he economy of a country is greatly dependent on trade transactions, which are, again, indispensably interlinked with a well-organized monetary system as medium of exchange" (B. Lahiri 1991:28). Thus, many studies of ancient coinage, markets and monetary systems focus on the construction or elucidation of an administrative system which is presumed to underlie any perceptible regularities. These assumptions of administrative control do not largely affect discussions of non-coin "money" as it appears in various forms, since these are usually seen as being subject to informal (but binding) cultural constraint, e.g. brass rods (Bohannan 1959) and shells (Vogel 1993; Armstrong 1924).

However, few of the assumptions about modern money appear to be universally true for ancient coins. The difficulties of maintaining a multi-metal system, and the setting of equivalency rates between gold, silver and other metals, meant that even within a polity, the exchange rates between standardized coins might vary (Lo Cascio 1981). In addition, parts of a polity might have a separate monetary

system: under the Roman Empire, "Egypt operated a closed currency system based on base silver tetradrachms struck at Alexandria. Silver coins of the kinds used elsewhere in the Empire were certainly excluded from Egypt, and it remains doubtful whether the normal use of gold coin was permitted there" (Howgego 1992). Thus, the currency struck by a polity's central authority may not be universally accepted even within the bounds of that polity.

The sanctity of the coin form in the modern world results in prohibitions against the melting of coinage, and the retention of the exclusive right to mint coins by the state. However, in the ancient world, coins were sometimes a convenient means of bullion transfer by merchants traveling from one polity to another (MacDowell 1990). Within the bounds of a political unit, bullion transfer might also occur, as in Egypt, where the separation of the currency systems was a cause of re-coinage (Howgego 1990). Coins could be struck by a variety of agencies on behalf of a wide variety of customers, so that mint-masters could make coins for individuals when supplied with bullion (Howgego 1990). The practice of minting coins for individuals was known in medieval Europe as well; and "(i)n those cases in which a king himself ran a mint he also acted more often as a private entrepreneur than as head of the State" (Cipolla 1967, cited in Wallerstein 1974:46).

Multiple minting loci also result when the demand for coinage is greater than the ability of central mints to

supply that demand, leading to the supplementation of base metal coinage with large-scale production of local imitations (Howgego 1992). Often, it is not clear what the relative exchange values of these local issues and imitations would be; an even more complex issue is the change in the representative qualities of coinage, i.e., the point at which a coin becomes a representation of value rather than an actual value. The change in value from actual (bullion) value to representative value can be tracked in the Roman world when debasements of coin were undertaken on a large scale, first by Nero in 54 A.D. (Lo Cascio 1981). These debasements had a dual effect: within the Empire, the value of the coin remained steady, but outside the Empire, its value as bullion dropped considerably (e.g. in India; see MacDowell 1990). However, this transformation, in the absence of historical documents regarding mints, is much more difficult to assess for other parts of the ancient world.

Given the ability of coins to carry symbolic, bullion, and exchange value, the assessment of the role of coinage must be made for an ancient economy in concert with other documentary evidence. The volume of coinage may indicate its role as a medium of exchange; however, coin volumes may be low in the archaeological record due to the remelting or restriking of coins (by modern collectors as well as in antiquity) and by the haphazard recovery of coin hoards. Furthermore, a low volume of coinage in antiquity would

only have hampered its use as a medium of exchange; it could have been used as a convenient standard of value in which other commodities were measured even as they were exchanged in kind under a system of barter.

Coinage may thus be perceived as fitting into an economy at very different levels, even simultaneously, so that what is regarded as a fixed standard of value in one polity (or in one portion of a polity), is regarded only as an instrument of negotiated value elsewhere. In the absence of standardized money-items, and prior to the invention and use of coinage, standards of value are maintained by all parties in an exchange; the presence of money-items such as coins merely streamline this process. More important than the presence or absence of coinage is the fundamental agreement between buyers and sellers about the value of the items and services exchanged; the need for such agreements points to the fundamental role of information and information exchange in trade activities.

The need for communication between buyers and sellers in a market, and the rapidity of modern communications due to technological advances, often leads to the assumption that communication in ancient economic systems was imperfect, thus reducing the efficiency of the market mechanism. A challenge to this assumption can be made on the observation that information transfer will be at least as rapid as the most rapid means of transportation available in a particular period. If one concedes the

existence of <u>any</u> market forces in a polity, one must also consider that market actors (buyers and sellers) desire information about the types of goods available, their cost and availability. It is especially critical for sellers to obtain information about the products desired by buyers, so as to maximize profit.

At least one case study indicates that information was consciously generated and transferred in the premodern economic sphere. One example comes from the Indian subcontinent, where Roman coins have been intensively studied. These Roman coins principally date to the early Empire period, an observation which has led to conflicting explanations: either trade declined after the middle of the first century A.D., or the objects of trade from Rome changed to some other item. David MacDowell offers the more comprehensive explanation that only certain types of coins were desired by the Indians, for use as bullion (MacDowell 1990:55). If the Roman coins were indeed being used as bullion, the rejection of debased post-Neronian exemplars would mean a loss for Mediterranean merchants; at most, it would take one sailing season for this information to return towards Rome and prompt merchants to carefully select the coins destined for shipment to India.

The conscious collection of information about desired goods did exist in the same period, as evidenced by the <u>Periplus of the Erythrean Sea</u>, a merchant's document of the later first century A.D. (Casson 1989). Written by a

merchant from the eastern Roman Empire, the document lists the types of merchandise desired at the various ports of the western Indian Ocean, and notes their relative value in different places (Casson 1989). As a list of saleable commodities for different ports, the Periplus serves as a reminder that the information needed by merchants in their dual role as buyers and sellers was sufficiently valuable to be written down and transferred.

The limitations of transport have often been cited as a deterrent to ancient trade. Prior to the development and use of the internal-combustion engine, overland transport was limited to human and animal-powered means. However, the limitations on transport appear to be organizational rather than technological. The organization of large quantities of human and/or animal labor could supercede limitations of technology or environment, as shown by the mass mobilization of state-consumed material by the Inka or the overland transport of quarried stone in Middle Kingdom Egypt.

The preceding discussion has indicated that the essential elements of exchange activity lie not with the presence of central agencies, but upon the simple elements of communication and transportation which characterize all exchanges from the transactions between individuals in a simple society to complex negotiations of global trade agreements. All of the critical aspects of exchange are fundamentally based upon information: information about

which resources to exchange, information about their value, and information about the way in which the exchange is to take place as well as about the physical routes utilized to transport items and individuals.

The basic need for information highlights the repertoire of special skills exercised by traders. In their home communities, traders can be viewed as a kind of marketplace or craft specialists; just as potters and weavers are technically skilled in their craft, traders master a specialized set of skills: negotiation and bargaining, transport, valuation of goods, information transfer, and loss protection either through cooperation with other merchants or via institutional means such as insurance. The mastery of communication techniques is incorporated into all of the activities of the trader: "Accompanying the exchange...are modes of communication formally extraneous to it. The dress of the intermediary, the form of transport he uses, and other features all offer channels of potential communication." (Renfrew 1975:23). Just as the potter or goldsmith earns a living through the practice of a craft, so does the trader provide a desired service and earns a living thereby. Like the manufacture of goods, the craft of trading requires capital investment (in goods) and the factors of risk and loss (where stolen goods are the equivalent of pots broken in firing).

Once the trader has exited the home community, however, a new role is defined. Whether they are state-

sponsored or independent, traders may venture outside the recognized boundaries of a political or social unit in a search for goods. Curtin (1984) discusses the ambiguous social role of merchants in foreign locales: welcomed as bearers of goods, but distrusted because they are strangers, merchants who regularly travel to certain entrepôts of trade may sometimes be sequestered into merchant communities. The role of merchants as "foreigners" has been examined, by Curtin and others, to investigate how goods and ideas are transferred across cultural or political boundaries (Curtin 1984). Again, information plays a critical role, since the essential component of merchants' success lies in negotiating across cultural lines.

## The origins of exchange activity

Trade networks can be assessed through the examination of both the mechanisms of trade and items traded. The examination of the component parts of modern economic constructs illustrates the many assumptions which condition the analysis of modern political and economic structures. Not all of these component parts can be identified for premodern complex societies; moreover, not all of these component parts need be present for the successful exchange interactions between individuals and groups. Much of the analysis of modern economic systems presupposes factors of

political involvement, in which central agents compel or facilitate trade. The role of central agents is often to provide physical facilities which in turn render income to the center in the form of tariffs or taxes which promote an upward spiral of capital accumulation and investment. However, it is clear that even where central agents are incapable of accumulating the surplus necessary to establish exchange infrastructure, trade is maintained.

Archaeologically, it is the study of dispersed items which provides the data which support models of trade interaction. The choice of data provides the parameters for the range of explanations which can be expected from the model. Different standards of data collection and reporting affect the scope of inquiry; in addition, factors of preservation may further limit the data set which informs upon the range and variation of ancient trade. These limitations are particularly felt in discussions of the origins of trade activity, in which the focus is often on the exchange of non-subsistence goods by political elites.

Research on the beginnings of trade interaction suggests that the expansion of the earliest trade in premodern complex societies was aimed at satisfying the status-related needs of elites. Brumfiel and Earle find the distinction between luxury and utilitarian goods as setting the stage for the organization of economic activity in early complex societies, citing "...the lack of

importance of subsistence goods for political development" (Brumfiel and Earle 1987:6). In addition to the emphasis on elite goods as the driving mechanism for the development of trade, there is a strong tendency to emphasize the role of elite goods throughout the time period under investigation. Wallerstein, speaking of European feudal trade, says that it was a trade in luxuries, which "depended on the political indulgence and economic possibilities of the truly wealthy" (1974:20).

The sequence in which types of goods become part of the realm of exchange is explained as an evolutionary sequence which parallels developments in socio-political complexity, so that "as trading routes and trading relationships became more firmly established, everyday goods were added to the merchants' repertoire...and came to supply not only valuable items for elites but also food staples and utilitarian wares for people in the society generally" (Berdan 1989:99). This division of "necessities" and "luxuries" closely follows Polanyi, who considered the former to be items such as textiles and household articles; "luxuries" included items such as "precious stones, silk and leather finery, cosmetics, and adornments" needed solely by the rich and powerful (Polanyi 1975[1951]:135). This analysis suggests that exchange activity is based on the demands of a small sector of society and that the mechanisms of trade inexplicably expand to accommodate the demands of a broader section of

society.

Prior to the expansion of trade routes, utilitarian goods (especially comestibles) are assumed to be the result of self-sufficiency, and therefore not perceived to be a driving mechanism for increased trade. Though utilitarian goods are needed by all, it appears that only when political structures become large and complex do they become involved in the activity of providing, controlling and transporting basic subsistence goods, as seen in the large grain-storage structures of the Inka empire (e.g., Snead 1992) or the large-scale ration programs of the Uruk polities (e.g., Johnson 1975). Even then, the provision of subsistence goods is specifically tied to projects sponsored by the state, in which subsistence goods are stockpiled to sustain laborers and otherwise utilized only in times of disaster (Earle and D'Altroy 1982). The large-scale consumption of goods reaches its apogee in the modern world, where the increased purchasing power during the Industrial Revolution prompted the inflation of socially-constructed needs, so that "'luxuries' came to be seen as mere 'decencies', and 'decencies' came to be seen as 'necessities'" (McKendrick 1982a:1). The consumption of ordinary goods is therefore viewed as an evolutionary progression, culminating in the modern consumer society.

The division between utilitarian and luxury goods is thus made with the accompanying assumptions of the political importance attached to such trade. When scarcity

or labor investment is manifested in an object, that object serves as a symbol for the owner's capacity to generate surplus wealth for the support of craftsmakers. In political terms, the possessors of rare goods are seen as having a place in the hierarchy of social organization through religious or political office; in the political realm, conspicuous consumption is economical because it creates distinction between rulers and the ruled (Sahlins 1963). The visible display of objects into which are incorporated elements of labor investment or distant origins signal the possessor as a member of an elite:

> "We would expect the members of the noble stratum to use specific symbols--in ritual performance, political actions, and social display--which contrasts with those used by ordinary people in terms of the breadth of their reference and their evocation of control over natural forces" (Wright 1984:54).

Luxury goods especially serve to identify important social actors during times of social change, as Hamilton and Lai illustrate for late imperial China, where the "constant rise and fall of family wealth and position and the uncertainty of one's family's status at any one point accentuated the use of material symbols to mark status" (1989:265). However, such examinations give undue emphasis to a small volume of elite-controlled goods, rather than the greater volume of goods consumed by all. In archaeology, this emphasis may be due to three factors: a long-standing bias towards the recovery of elite residential and burial contexts (with concomitant social status achieved by

archaeologists working in such contexts), the greater invisibility of perishable commodities such as foods and textiles in archaeological sites, and the perception that symbolic value is limited to rare items. However, this division between "luxury" and "utilitarian" or "subsistence" goods obscures two critical aspects of economic interaction as a dynamic process: it assumes that the archaeologist can unambiguously determine which items constitute "subsistence" and "luxury" goods for an ancient economy, and it ignores the potential for symbolic goods which are required throughout a social system and utilized by persons throughout the social and political hierarchy.

The identification of "luxury" goods in an archaeological context is often made through an evaluation of their scarcity in a site or a region, and/or the distance to a source of supply, with the implications of wealth or privilege additionally inferred through rare or elaborate iconography, materials or labor-intensive craftsmanship. But the identification of what constitutes a luxury good may change through the time-period under investigation, since dynamic interactions between politically unlinked trade regions or shifts in internal sociopolitical organization can transform the status of goods. There are cases where one era's luxury good becomes the next era's basic subsistence commodity, as Rice shows for the use of obsidian in the Classic and Postclassic Maya periods (Rice 1987b).

Changes in the structure of supply which increase or decrease availability can affect a status-marker: in Ming China, the quantity of pepper brought in tribute by the explorer Zheng Ho resulted in it plunging from an elite good to a subsistence one (Finlay 1992). And in Britain at the beginning of the Industrial Revolution, calico cloth from South Asia was initially perceived as a luxury material but soon was imported in such quantities that it became widely available (Miller 1987). By contrast, ordinary goods can be elevated to the status of preciosities under conditions of need; grain, usually considered a low-value, bulky item, can dramatically increase in status and price when scarcity necessitates import, as Braudel indicates for early modern Europe: "Wheat, a heavy and comparatively cheap commodity, travelled as little as possible, in the sense that it was grown everywhere. But if a bad harvest meant that it was in short supply for any length of time, it might be sent on very long journeys" (Braudel 1992[1979]:178).

Changing social values also affect the perception of a good's status: from the 16th century European point of view, pepper was "not quite" a luxury good because it was used in the preservation of food; likewise spices were used as medicines (Wallerstein 1974:333). From the modern point of view, gold appears to be an elite item by virtue of its rarity and unique metallurgical qualities. However, the perception of these items by the society under examination

may have depended on factors other than raw material. Mary Helms, in an examination of the use of gold ornaments in ancient Panama, makes a strong argument for the distinction of gold pieces on the basis of the manufacturing technique: ornaments of beaten gold were relatively plentiful, indicating general access, but objects of poured gold were rarer.

Her interpretation suggests that the differential technique of manufacture, rather than the raw material, reinforced and identified social distinctions among the ancient Panamanians (Helms 1979). A further example of the potentially misleading consequences of modern aesthetics comes from the Mediterranean world. Frankincense and myrrh, which are considered luxury items by modern scholars, would not have been so regarded by ancient standards, since they were used for medicinal, religious and funerary practices (Sidebotham 1989). However, they could only be obtained at specific locales in the Arabian peninsula, and were transported from there throughout the Mediterranean. These special-purpose goods are difficult to define as either "luxury" or "utilitarian", since they were deemed essential, or at least desired, by a large segment of the population and apparently could be obtained regardless of political conditions in the source area.

The study of trade in elite commodities not only has affected the assessment of trade origins, but has obscured discussion of the role of exchanged goods for all sectors

of a population. The division of goods into "luxury" and "utilitarian" creates a false dichotomy, obscuring the importance both of goods whose status is ambiguous or changing, and of goods widely used by all sectors of a population. Archaeological and historical documentation confirms that the vast majority of exchange goods in terms of both volume and frequency consists of goods whose access is not restricted to political or religious elites; the following chapter will examine the way in which symbolic value is attached to all material items, and the role of that symbolism in fostering exchange activities.

## CHAPTER III

## MOTIVATIONS FOR LOCAL TRADE: MATERIAL CULTURE AND SOCIAL STRUCTURE

The purpose of this chapter is to examine the motivations for local trade. The circulation of items in a local trade network is proposed to be the result of a compelling need for items of everyday use, in which symbolic value is attached to ordinary domestic goods as well as to ritual items. The symbolic value of goods as the material manifestation of social interactions is a way for individuals to proclaim their group identity; this identity is a key factor in creating and maintaining social bonds. When political structures are fragile, these social bonds are particularly valuable for survival. The study of both "elite" and "non-elite" goods and their role in the social system provides an explanation for the long-term viability and success of regional trade networks in the absence of political cohesion through the examination of the role of diverse material goods in maintaining social ties.

As seen in the previous chapter, the starting-point for the analysis of premodern complex societies have as their base either ethnographic observations of small-scale

societies, or are based upon analyses of large-scale, extractive economies associated with modern nation-states. Both approaches provide important observations about the role of goods in social interactions. While the mechanics and logistics of trade may alter dramatically with the addition of increased bureaucratic interaction and administrative and political hierarchies, the social value of objects can be seen to provide an impetus for exchange in societies at all levels of complexity. In addition, the use of material objects in human culture is visible through many archaeological contexts in which the quantity and types of goods serve to distinguish individuals through their household and mortuary goods.

## Identifying the motives for exchange

The manifestations of exchange in premodern complex societies are clearly recognizable in the archaeological record. The identification of the mechanisms which permit that trade, such as those presented in the previous chapter, establishes that exchange activity is predicated upon a very basic set of elements available in all human societies: a means of transport, and the ability to communicate about the value of the exchanged items. However, the isolation of these two basic requirements as the key elements of exchange activities still does not explain why trade occurs. It is insufficient merely to

demonstrate on a theoretical level that political instability is an insufficient deterrent to trade. Stated more positively, why should trade persist under less-than-perfect conditions? It is proposed that trade is compelling because goods are desired for both their physical properties and for their capacity to be invested with social symbolism.

The sharing of information is necessary for the successful transfer and valuation of goods and services. But information-transfer is not merely a component of exchange activity: it is the fundamental requirement for cultural cohesion as conveyed through both language and non-language forms of communication. The existence of trade is the result of the use of material culture to symbolize and reinforce social interactions, and as such, exists in all societies irrespective of the types of political formations found within them. Such motivations for exchange activity explain why trade is sufficiently compelling to continue even during periods of reduced trade facility.

Two realms of study illustrate the social role of goods within and between groups: ethnographic literature on trade and exchange which highlights the role of goods in maintaining social constructs in small-group environments, and modern material-culture studies, which inform on the role of mass distribution in building and maintaining status between groups and across space.

**Ethnographic case-studies**

The use of the human body as a canvas constitutes the most basic utilization of physical material for the purposes of self-identification and self-projection within a group. In "The Social Skin," Terence Turner notes that "the surface of the body seems everywhere to be treated, not only as the boundary of the individual as a biological and psychological entity but as the frontier of the social self as well" (1980:112). He examines the modification of the body by the Kayapo people of the Amazon: though they do not actually wear clothing, the treatment of the human body itself (through bathing, and the selective removal of hair depending on a person's reproductive status) indicates an individual's general participation in the social arena. Ornaments, such as lip plugs, ear ornaments, body painting, and penis sheaths, further identify individuals as members of cross-cutting social groups based on status, age and gender.

The "social skin" thus identifies people within groups, but also distinguishes groups from each other, so that "bodily adornment...may thus be said to define the total social identity of the individual, meaning his or her subjective identity as a social actor, as well as objective identity conceived in terms of a set of social categories." (1980:136). Thus, utilizing the basic material elements of the human body, individual identity vis-à-vis group

categories is established, altered and maintained throughout the lifetime of the person. Turner's study indicates that the most basic elements of the physical world are utilized to convey information. In societies with a more expansive set of material culture, the use of physical objects to specify personal, familial and group identity becomes increasingly more complex with the addition of new items.

## Modern consumption behavior

Most modern studies of consumption examine the enormous array of goods available in the modern world, and the mass production techniques which enables the continual alteration of styles (McCracken 1988; Miller 1987). As seen in the previous chapter, the familiarity of our own economic circumstances, and the apparent rapidity with which European transformations in productive capacity caused perceived changes in social structure, have led many researchers to conclude that the obsession with material goods has no premodern parallel and that the rationale for mass consumption is to be found in recent, capitalist developments (Gottdiener 1995; McCracken 1988; Preteceille and Terrail 1985). Fortunately, as will be discussed below, the assessment of the role of goods can often be detached from assumptions of post-industrial uniqueness, providing an important means of identifying the role which

goods play in human social interactions.

Again, a return to formal economic models, and to the history of modern capitalism, facilitates the discussion of the role of goods for all members of a population. The study of production constitutes the standard focus of both traditional and Marxist approaches to the explanation of economic processes (Fine and Leopold 1990; Warde 1990; Hamilton and Lai 1989; Orlove and Rutz 1989; Gregory 1982). For Marxists, production is the moment of estrangement for the worker, who rarely makes an item from start to finish (Miller 1987:191-195). The focus on production is likewise seen in archaeological studies, where the study of artifacts has often concentrated on the techniques and loci of production, and the study of finished products to evaluate the level of standardization and craft specialization (e.g., Rice 1981).

The study of consumption by economists and sociologists--who previously viewed consumption as either the end-result of production or a derivative of distribution--is a recent development, prompted by political considerations, shifts in social thinking from the value of work to the value of leisure, and the privatization and recommodification of public services (Warde 1990). When consumption was studied in the past, it was frequently invested with a moral aspect: most consumption was seen as <u>over</u>-consumption, with the attendant implications of the sinfulness of excess. The morality of consumption was

actively debated in England in the late 17th century, just at the same time that greater quantities of consumer goods were being made available. The debate was carried out in a variety of public fora, including popular literature, with one of the more notable works of this genre being Mandeville's Fable of the Bees (McKendrick 1982b). But as both production and purchasing power increased, the elasticity of demand became incorporated into social commentary and economic models, so that by the time of Adam Smith the "value of a heightened propensity to consume was widely accepted" (McKendrick 1982b:19). Nonetheless, the morality of (over) consumption was subsequently raised by other social critics, notably Marx and Veblen. More recently, ethnographic observers of non-Western societies have depicted consumption, often of mass-produced Western goods, as an erosion of traditional culture (Miller 1995; see also Wilk 1990).[1]

For economists, the wastefulness of overconsumption lies in the resultant loss of productive capacity rather than any abstract theological notions. Since the goal of capitalism is the unlimited production of surplus, there are only two kinds of consumption: that which ultimately

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[1]One example of how the introduction of a modern economy is disparaged by anthropologists is shown by this statement: "The Tiv of the lower Benue river, Nigeria, are alleged to have had three such separate spheres (of exchange) before European money wrecked their system" (Douglas and Isherwood 1979:138)

benefits production, and that which does not. The latter case is perceived as a dead-end for capital, in that once an object is consumed it ceases to be of importance for the producer; Adam Smith, for example, viewed consumption as 'unproductive expenditure' compared with investment (Fine and Leopold 1993:16). A more complex notion is that of "productive consumption", a term utilized by those who reason that all consumption streamlines into productive activities, since consumption is essential for social reproduction, which is in turn provides the labor-force needed for productive activities (e.g., Gregory 1982; Douglas and Isherwood 1979). The reconsideration that consumption is neither socially nor economically "wasteful", but has instead an important social purpose, is an important step in the analysis of the role of material objects as a means of establishing and maintaining social identity.

Formal economic models assume that individuals act in accordance with abstract "rational" principles and thus have a limited scope for the accommodation of the social factors encompassed in economic activities. The utilization of the perfect market as the basis for economic analysis is first found in the works of 17th and 18th century economists. In the perfect market, the only consideration for economic activity is based upon price: suppliers seek to maximize profit, and buyers seek to maximize utility. Each transaction is undertaken solely

upon these criteria, with no regard for the social relations engendered by repeated economic interactions between buyers and sellers grown familiar to each other. Adam Smith even declared that sellers should not socialize, since that would create the risk of groups monopolizing markets (Granovetter 1985).

The concept of a perfect market was also the starting-point of Karl Marx's work, but he saw it as fundamentally deleterious: the process of transactions between strangers as they exchanged alienable objects in a state of reciprocal independence resulted in general alienation (Gregory 1982). In the anonymity of the market which continues to be the basis of formalist economic models, the atomized, rational individual is the standard consumer-unit (see Granovetter 1985; see also Fine and Leopold 1993; Orlove and Rutz 1989; Douglas and Isherwood 1979). This view of the consumer as isolated means that "the social dimension of consumption has often been lost" (Orlove and Rutz 1989:18). However, studies of actual market behavior have demonstrated that social activities affect <u>both</u> production and consumption (Dannhaeuser 1989; Granovetter 1985; M.E. Smith 1989).

Examples of social factors which affect production can be found in the literature of the sociology of business organization. Social relations result in decreased competition, but the potential disadvantages of market loss are compensated by the continuity of contact which

maintains levels of quality. Even when there is no formal link between buyers and sellers there develops, for the sake of efficiency, a habit of contact; M. Granovetter gives the example of construction firms which work with habitual subcontractors rather than searching out new workers for each job (Granovetter 1985). While new hiring would follow the expectations of a perfect market, it would also mean learning to work with new people each time; the advantages of retained personal contacts and working relationships results in "an overlay of social relations on what may begin in purely economic transactions" (1985:498).

The social aspects of consumption are found in repeated and long-standing relationships between buyers and sellers, in which buyers patronize only certain sellers in a market. Habitual consumption is also found between itinerant vendors and the neighborhoods in which they sell their wares. The effectiveness of brand-name advertising also attests to the existence of habitual consumption patterns, even in premodern contexts. As early as the Sung dynasty of China (960-1279 A.D.), "the imperial economy was extensively commoditized" with a large number of basic items such as rice, tea, cloth and metal bearing product labels (Hamilton and Lai 1989:253). Likewise, Roman amphorae were stamped prior to the firing of the vessels, indicating the geographical origins of the commodities (principally oil or wine) with which they would be filled. One could argue that any kind of container-marker, whether

placed on an item by the manufacturer or by a regulating agency, constitutes a "brand" or authentication since such a marker indicates the adherence to standards of origin, purity, etc. which communicate information to the consumer.

The subsequent interaction between people exchanging those goods is facilitated by the internalization of information about the reliability or content of the goods themselves as well as the reliability of the partners in the exchange. Rather than being a specific kind of exchange mechanism, a market is a "human phenomenon", meaning that the term should not relegated only to those types of markets with coinage or other particular qualifiers (Mauss 1990). Echoing Mauss, Fine and Leopold conclude that "(t)he market is a social institution and not just an enabling mechanism" (Fine and Leopold 1993:56). Social interactions affect both production and consumption activities; in the realm of consumption, the acquisition of goods subsumes two significant levels of activity: the act of acquiring, and the use of the items acquired.

The means of studying consumption behavior, and the role of consumption in economic development, are not yet clearly articulated. Efforts to introduce the social aspects of consumption into formal economic constructs have met with resistance by economists, who have responded to studies of the psychology of consumer activity with a revival of formalism by "new institutional economists" who see market forces as entirely rational (Granovetter, 1985).

The studies of consumption which do exist are principally descriptive of consumer behavior in various contexts, for example as a component of economic history. Neil McKendrick argues that the Industrial Revolution in 18th century England was partially the result of a shift in consumption patterns, where consumption was spurred "by social emulation and class competition," and facilitated by increased purchasing power in the form of higher real wages (1982b:11).

At the end of the 18th century, low-cost articles such as beer, soap, candles and other excised commodities showed a rate of consumption which increased twice as fast as the population, leading McKendrick to observe that the industries which first blossomed in the Industrial Revolution were located in the consumer sector rather than the heavy industrial sector (McKendrick 1982b).[2] While offering critiques of some of the specific elements of McKendrick's argument, Fine and Leopold (1990) agree that a study of the role of consumption in the development of modern industrial capitalism is long-overdue, and has an advantage over investigations focused merely on production. In assessing the need for such studies, they make the

[2]It is also interesting to note that Adam Smith, in describing the organization of technological change in mass production, chooses for his examples ordinary domestic goods such as pins and guns rather than complex or special-use machinery (Smith 1976[1776]).

general statement that demand is associated with culture, style and life-style, "which serve as the analytical counterpart to technological change" (Fine and Leopold 1990:154).

Descriptive studies such as McKendrick's generally focus on mass-produced goods (e.g. Gottdiener 1995; Friedman 1990; Miller 1987; Wilk 1990). By contrast, the role of luxury goods is perceived as rather marginal in development of modern economies. Braudel, in Capitalism and Material Life, indicates that "before the nineteenth century and its innovations, luxury was more like the action of an engine often running in neutral than an element of growth" (1974:123-4 [check quote; this is cited by someone else). If this is the case, there may be a significant deficiency in seeing luxury goods as the principal impetus for trade activity in premodern complex societies as well. The resolution of this potential dilemma may be found in examining the role of goods and of goods-transactions in both modern and premodern economies. When both types of economies are examined, it appears that their difference is chiefly one of scale, and that they share a basic premise: that symbolic and social behavior are the principal underlying motivations for the exchange and use of goods.

## The role of goods

Both ethnographic and modern material culture studies indicate that objects are invested with symbolic value, and are utilized to visually reinforce social categories and relationships. Ethnographic and archaeological studies have usually emphasized high-value goods as items of prestige-management, closely linked with the demonstration of political strength. By contrast, modern material-culture studies show that every object embodies a symbolic aspect. This symbolic value is created and negotiated by individuals in cultural contexts, where "any material commodity can assume a multiplicity of meanings through social interaction" (Gottdiener 1995:179). Consumption itself becomes part of the socially-negotiated sphere; the economic historians G. Hamilton and C.-K. Lai observe that "Consumption, like language, is a form of symbolic communication, the form and content of which is not reducible to the individual actor" (1989:268). Others have re-analyzed ethnographic data to show that consumption is not a passive element of social interaction, but contains transformative elements: "since the use of goods can both mark and change social relations, consumption forms an arena for other conflicts generated by changes within the local economy" (Orlove and Rutz 1989:3).

The symbolic aspects of consumption point out the error of formalist models which assumes that individuals

act rationally according to price evaluations in the market. The assumption of rational behavior also predicts that people will prioritize consumption activities to ensure that the needs associated with physical survival will be met as a first priority. However, as social scientists often lament, the allocation of resources towards subsistence goods by the poorer sector of society often fails to match this prediction, with instead the consumption of apparent luxuries eating up a large proportion of the household budget (see Douglas and Isherwood 1979).

Nonetheless a rational explanation exists for this form of consumption as well. For example, the consumption of goods in the social arena may include the socially-sanctioned expectation that the better-paid employees will publicly spend a greater proportion of the bills for communal entertainment, subsidizing the lesser-paid individuals and maintaining social harmony (Douglas and Isherwood 1979). The consumption of expensive goods by the economically disadvantaged may also convey expectations about future earnings, perceived status, or the desire to ingratiate the individual with more influential members of the group in the anticipation of reciprocity (Douglas and Isherwood 1979; for examples, see Wilk 1990 for Belize; Friedman 1990 for Western Africa). Dannhaeuser (1989:224) discusses the purchase of luxury goods such as VCR's, televisions and packaged foods by low-income sectors of

urban populations in various modern societies. These goods are purchased on credit, and reflect factors of perceived necessity, convenience and prestige (Dannhaeuser 1989). These examples indicate that the "price" of a good is neither an indicator of the wealthiness of the household, nor the social class of the owner; instead, the value of goods is evaluated by purchasers not only in terms of their financial cost but in terms of their social value.

The perception that goods are invested with social symbolism not only negates the concept of the "rational individual" as a unit of consumption, but that there can be an exclusively logical or functional interpretation of the goods themselves. In some cases, strictly functional aspects of items may be rendered less effective because of cultural prescriptions. While the evolution of modern automotive styles may be the most striking illustration available, it is perhaps more useful to examine the cultural elements present in low-technology goods to illustrate the way in which symbolic values are an integral part of basic "utilitarian" items.

D. Miller, in his study of the cooking vessel repertoire of households in the Malwa area of western India, evaluated the physical properties of vessels and predicted that vessels for items which required greater attention while cooking would have large openings to facilitate stirring, as would water pots since large openings would facilitate dipping (Miller 1985).

Counterintuitively, he found that both water vessels and milk-cooking vessels have a narrow opening; confounding the expectations of use-efficiency were prescriptions of social purity, in which greater restriction corresponded to a greater perceived purity in foods (Miller 1985). Claims of "efficiency" or "utility" by object-users may not bear scrutiny under alternate value systems, so that questions of efficiency may be hard to substantiate or estimate for ancient populations.

M. Gottdiener (1995) proposes that the use of material objects constitutes a form of information-transfer, the study of which he terms socio-semiotics. The use of a socio-semiotics approach resolves the dilemma of the production-consumption dichotomy of other economic analyses, because it "captures the point of view of both the producers of culture and the consumers of culture" (1995:29, emphasis original). Signs are created, expropriated and used at the level of lived experience, and permeate everyday life: "The premise of socio-semiotics is that any given cultural object is both an object of use in a social system with a generative history and social context, and also a component in a system of signification" (1995:29).

Gottdiener calls upon Peircian semiotics as a basis for understanding the "more global relationship between modes of representation and culture, including material forms," in which there is always a referent to empirical

reality (1995:11). This empirical reality often refers to social relations, in which individuals read material culture ensembles to locate themselves vis-à-vis other people and groups. As indicated in the previous chapter, information is the critical element of economic transactions. But the need for information is more than just a component of exchange; it is the critical basis of all social interactions, and affects cultural activities from human-land interactions at the subsistence level to complex and hierarchical political relations.

The enduring presence of the physical world means that people do not have to be actively present for information to be conveyed, so that material objects serve as a form of information-storage.[3] Objects are not a mere reflection or passive container for communicative messages; their existence as empirical realities is required for any communication at all. Explaining his view of the superiority of Peircian semiotics, Gottdiener elaborates that "All sign value implicitly presupposes its material expression, and, in the same way, all material objects exist within socially constructed semantic fields in order for them to be understood and used" (1995:54-55). "Ordinary" goods convey information in the same manner as "luxury" goods; likewise, both "traditional" and "modern"

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[3]M. Wobst makes a similar point in his discussion of the use of headgear among the inhabitants of (the former) Yugoslavia (Wobst 1977).

goods are encoded with social values.

Examinations of the social role of Western-produced goods in traditional societies question the application of a moral standard for the evaluation of consumption, since the anthropological protection of "pristine" groups is thwarted by the fact that these groups actively seek to consume (Miller 1995; see also Parkin 1993; Wilk 1990). In Gifts and Commodities (1982), C.A. Gregory examines the way in which the availability of new ways to consume have affected traditional societies in Papua New Guinea. While the acts of acquisition and consumption have replaced previously-existing modes of authority because young men can acquire status and goods by working for cash wages outside the community, the goods themselves are woven into pre-existing social constructs.

Following the sentiments of Sahlins and Polanyi that the distinction between gifts and commodities forms a continuum, Gregory observes that the "colonisation of Papua New Guinea has not produced a one way transformation from 'traditional goods' to 'modern goods', but complicated a situation where things assume different social forms at different times and in different places" (1982:116). Similarly, B. Orlove and H. Rutz have reanalyzed ethnographic observations about the introduction of modern capitalism to the Indonesian village of Kali Loro, concluding that while capitalism brought change, the way in which the village received capitalism reflected earlier

social patterns (Orlove and Rutz 1989; see also Hamilton 1977, for a similar process in 19th-century China).

The acquisition of goods thus enables individuals and households to display and negotiate status and group identity, while the exchange of objects serves as a means of confirming information created through other forms of communication. In the kula ring, what is effected is not the transaction of mere objects, but "shared knowledge about a network of mutual confidence" (Douglas and Isherwood 1979:148). As seen above, this network comprises partners who not only exchange valuables, but also exchange subsistence goods, sometimes across environmental zones. The communication sustained during the kula transactions includes information about the types, quality and quantity of goods potentially available, as well as information about trustworthiness and the exchange partner's ability to deliver subsistence goods when needed.

The use of a socio-semiotics approach encompasses two additional avenues of inquiry: the way in which signs achieve their meaning, and whether objects-as-signs are equivalent to a language, with all of the implications of language. While the full discussion of such a subject falls beyond the purview of this document, some important aspects of the interpretation of signs and sign-values are discussed in the following paragraphs.

For Marxist scholars, the use of signs is yet another means by which the dominant classes manipulate the laboring

masses (Orlove and Rutz 1989; Millot 1988; Preteceille and Terrail 1985:29). For Gottdiener, one of the central aspects of the socio-semiotic approach is "the identification and analysis of mechanisms that constrain knowledge and limit or manipulate meanings through the deployment of power relations" (1995:12). However, the examination of actual consumer activities compels Gottdiener to modify his stance, leading him to refute the proposition that there is a one-way imposition of the sign value from dominant, producing classes to subordinate, consuming classes.

In several case studies about modern American consumption of clothing, public space and automobiles, Gottdiener suggests that the manipulation of symbols by consuming groups (which includes the physical and individualized alteration of mass-produced goods), is then reflected back into the production process as manufacturers adopt the alterations to create new styles (Gottdiener 1995). Another example of the failure of dominant groups to impose sign values is offered by D. Miller, who cites the case of advertising which "fails" to impart the manufacturer-designated message (Miller 1987). One might cynically respond that the goods are clearly sold anyway, but the important point is that the generation of sign-value is not the result of singular, unilateral impositions of meaning: the "meaning" of objects may be suggested by producers, but the actual understanding of symbolic content

is determined by consumers.

Hierarchy is only one type of distinction which is accomplished with material goods; the use of material culture is also a way for groups at the same hierarchical level to distinguish themselves from each other. Finally, the consumption of goods is also the means by which individuals state their identity, often as a member of several cross-cutting social groups. Individual choice (free will) is maintained because at least some of the symbolic elements encoded in material objects are directly accessible and intelligible to the individual using them. At the same time, the potential for disorder is constrained because context provides a set of limits on what can be conveyed to others.

Daniel Miller cautions that the exact meaning of an object is difficult to discern because the complexities of social identification via material objects means that many things can be symbolized through the same object. Because meaning is imparted neither unilaterally nor hierarchically, the simplistic search for a formal order in the "meanings of things" is bound to cause difficulties. Miller suggests two descriptive means by which the symbolic value of objects can be assessed. One is through fuzzy set theory, which is "concerned with the nature of a logic whereby objects are not, as in conventional logic, either members or non-members of a given set, but rather are considered as better or worse representatives of that set"

(1987:8). Another is to view material objects serving as a "frame" for symbolic activity, where a "frame" refers to the potential range of meanings which can be symbolized in an object, though not all of these meanings are simultaneously expressed or emphasized (Miller 1985). Both fuzzy-set and frame theory provide a means for the investigator to delimit the potential meanings of the object or set of objects in a given setting, just as context provides a means for the communicators to delimit potential meanings.

In sum, the use of material objects expands upon the "social skin" to enable individuals and groups to identify and distinguish themselves within parameters which are socially-driven and culturally-prescribed. Multiple roles can be simultaneously identified with the addition of material culture items, even if not all of those items are being actively used. Shifts in context emphasize different symbolic aspects of the same object at the same time. Potential meanings are socially-constructed, so that material objects are very flexible potential embodiments of information, though the (literally endless) variety of information is also restrained by cultural understanding. Gottdiener agrees that context limits the number of possible meanings; after a discussion of the deconstructionist tendency to use polysemy (multiple potential meanings) to undermine all grand systems of meaning and interpretation, he notes that in practical

terms, the presence of cultural context--and of the empirical world in general--places limits on the number of potential meanings (1995:24). Furthermore, collections of material culture items should be assessed as a group, since "meaning is in the relations between all of the goods, just as music is in the relations marked out by the sounds and not in any one note" (Douglas and Isherwood 1979:72-73). The study of groups of items in their contexts enables the symbolism of cross-cutting artifact groups to be assessed without necessitating the discovery of the specific meaning of any object or object class.

Material objects have the capacity to serve as communicative devices which individuals and groups utilize to signal status and frame other types of interaction. But do material objects serve as a language in and of themselves? Most scholars agree that material objects and their use do not constitute a language, but there are considerable differences of opinion about why this might be the case.

McCracken (1987) argues that material culture objects do not constitute a language-like form of communication because while both language and material culture are composed of units which are compiled to express thoughts, material culture is read strictly as an ensemble. He uses the example of clothing, in which individuals in a study were asked to decipher a "sentence" of clothing from photographs to give an interpretation of the wearer's

occupation. When clothing was read piece-by-piece instead of as a whole, it became more difficult for the observers to make a judgement about the person. McCracken concludes that "the interpreter of clothing examines an outfit not for a new message but for an old one fixed by conventions. Combinatorial freedom can be exercised by the wearer only with the effect of baffling the interpreter" (1987:117). Only in language can new thoughts be innovated, but as Peirce affirmed, language as a mode of information always contains a referent to empirical reality (Gottdiener 1995:11).

Miller suggests that the use of objects is often extra-linguistic, because "order which is neither expressed nor acknowledged at the level of language may have a particular importance in the study of social reproduction, precisely because it acts to constitute social relations at a level which appears mundane, natural and therefore less open to explicit refutation or confrontation" (1985:11). However, it is important to note that in Miller's view the expression of social constructs through objects is conducted not because such concepts could not be expressed in language, but because objects are a more subtle means of communicating socially-relevant information.

The use of objects in a social setting also establishes important frames of reference prior to the use of language, since information about status and the implied relationship between interlocutors is efficiently

established visually. Utilizing examples from 19th-century fiction to indicate that individual characters use their hosts' goods as status clues, Douglas and Isherwood observe that there is always a need for information about the changing cultural scene (1979). While their examples are narrowly-focused, one can expand on their argument to observe that in all human societies, individuals are subject to changes throughout the course of a lifetime, based on life-cycle events such as marriage, reproduction and aging. The use of a "frame" of material referents enables individuals to transmit and receive information *sotto voce*, setting the stage for the appropriate types of interaction at the creative level of language. [the cognitive sphere changes much faster than the material realm].

In sum, the study of consumption illustrates that individuals seek to provide themselves with goods which fulfill a variety of roles, from the needs associated with biological survival to the material expression of abstract philosophical and theological concepts. Symbolic investment is made in all types of material goods, and provides people with the means of conveying a variety of information in a multiplicity of contexts.

## Socio-semiotics and archaeology

Archaeologists have in the past acknowledged the

importance of luxury goods, but those goods are assumed to be acquired and utilized only by elites (Brumfiel 1987). The distribution of elite goods appears be rooted in political exchange spheres, where the ability to acquire elite goods may be based upon factors of genealogy or political prowess which result in the bestowing of either elite goods or the right to acquire elite goods. The acquisition of elite goods may involve market activity though only certain individuals may have the ability to purchase them, where the purchase price includes both social sanction and forms of physical wealth. The need for an expanded paradigm for non-elite trade is necessary because this trade is not primarily political in origin; that is, political circumstances can affect, thwart or facilitate trade, but it is not the driving motivation for that trade.

The role of symbolic goods for a larger segment of the population has not been a focus of the analysis of ancient economies, yet the presence of some non-comestibles in large quantities and with a broad distribution in archaeological contexts invites a discussion of the role of social symbolism as a factor in goods-selection. An acknowledgement of the social realm of goods also resolves a false dichotomy between elite/non-utilitarian and non-elite/utilitarian goods, since the comparative utility of goods is determined with reference to a "frame" or set of cultural meanings. The view that all goods manifest some

symbolic aspects is also a step towards the resolution of the substantivist-formalist dichotomy, since goods can be distributed through different mechanisms in the same society (and may thereby change their meanings depending on the form of transfer). The acquisition of goods involves the allocation of resources by the individual or household, where "purchase" reflects the expenditure of financial or social capital.

As Miller indicates, it can be difficult to isolate the "meanings" of things even in modern circumstances where the range of potential contextual meanings can be identified (Miller 1985). Although all ethnographically-documented modern groups, from simple bands to modern industrial societies, are actively involved in the consumption of goods where goods are invested with social significance, can we presume this to have been the case in premodern complex societies as well? Several approaches confirm that in antiquity, symbolic value was consciously applied to objects, and that even ordinary goods were encoded with a variety of contextually-bound meanings.

This can be seen in the study of decoration, in which decorative styles as purposive design elements are universally acknowledged to carry meaning. "Style" can be defined as "formal variation in material culture that transmit information about personal and social identity" (Wiessner 1983:256). This variation can be observed as a factor in the creation and use of functionally-equivalent

items (usually tools, such as the projectile points of the Kalihari San studied by Wiessner (1983)). While the acknowledgement of formal variation in the archaeological record is not problematic, there is an ensuing difficulty in resolving whether that variability was the result of intentional "encoding" by the artifact manufacturer. Advocates of the iconological approach to style proposed that style as iconography is consciously manipulated by artisans for social ends, where symbolism is purposefully integrated into objects (e.g., Wobst 1977). The advent of purposeful symbolic behavior is coincident with the emergence of biologically modern humans; style, used to convey information, is argued to be an adaptive mechanism which increased predictability and reduced risk (Conkey 1978).

Another way to demonstrate that symbolic value was consciously applied to material objects in premodern societies is to examine the range of goods which have functional equivalents in a variety of materials. The most common archaeological example is found when there are local substitutes having physical properties equivalent to goods from distant sources. Functional equivalents are visible in architecture, for example, whenever people render prevailing architectural styles in locally-available materials. With regards to the material components of frequently-used goods, materials valued for their physical properties may have local equivalents: quartz for mica in

pottery, or sandstone for basalt in grinding technology. Ornaments and other decorative items contain an even greater potential for raw-material substitution, since they can be fashioned from a variety of locally-available materials such as bone or clay. Since the "utility" of any good is culturally-determined to a certain extent, choices between functional equivalents may be based on symbolic value, as shown by Gottdiener: "Objects involved in the everyday life of social groups are used because they perform some practical function...however, these use values can also be transformed by users into sign vehicles that signify a second-order function" (1995:181).

The value of all types of display items is transmitted to all persons in a culture, including to those who do not themselves have the wealth or social sanction to acquire and possess these goods. As indicated by Wright, the use of luxury goods by political elites establishes a frame of reference (Wright 1984). The use of luxury goods is an effective means of non-linguistic communication which reinforces and symbolizes power relations achieved in other social spheres (e.g. through birthright or warfare). But the projection of symbolic value is only possible when that notion of value is sustained by the entire group. The recognition of value is what enables material objects to symbolize status for political or religious elites; likewise, household goods and items in the domestic sphere serve the same purpose because they reflect socially-

sanctioned constructions of individual and household identity. Within groups, visible symbolism such as ornamentation or other display goods serve to reaffirm individual identity and membership in the group. In complex societies, visible symbols become especially important as a means of efficient communication between members of larger population groups who no longer have face-to-face interaction and require a means of identifying individual status as a predeterminant of appropriate and permitted interactions.

**The archaeological implications of a study of consumption**

In many ways, the study of production is more straightforward than consumption, because the loci of production tend to be limited whereas the loci of consumption are widespread.[4] If production exists, then consumption is assumed, as was shown above for formal economic models. Production loci are often discrete, so that the study of production is more amenable to archaeological investigation. Many types of production loci can be pinpointed using a variety of remote-sensing techniques; once the area is excavated or surveyed, various

[4]This observation is also made about the relative visibility of production and consumption loci in historically-documented cases, as noted by Hamilton and Lai (1989:267).

types of scientific techniques may be applied: sourcing studies for raw material, and studies of workshop debris to assess the scale and organization of production. The elements of production often can be easily isolated, though the vagaries of preservation may affect the amount of material recovered by the investigator.

The study of craft specialization in archaeological contexts provided a means to evaluate the mechanics of large-scale craft production. Only recently, however, has the discussion of craft specialization gone beyond the mechanics of production and raw-material acquisition to address the implications of the consumption of these mass-produced goods for social structure. In her examination of the organization of craft production in third-millennium Mesopotamia, Wattenmaker documented the presence of both specialist-produced fineware pottery and non-standardized cooking pots in all households (Wattenmaker 1994). The distribution of specialist goods "underscores the fact that rural nonelite households were active participants in the material component of the social system" (1994:115). More importantly, she offers that the use of specialized pottery was not merely the result of households taking advantage of production efficiencies in manufacturing techniques or large-scale production, but that "the demand for specialist-produced goods appears to be closely related to their social significance, as well as to other considerations such as productive efficiency" (Wattenmaker

1994:118).

Though Wattenmaker does not examine the rationale for attaching social significance to specialist-produced goods, the acknowledgement of a wide range of consumer goods of varying type and their social qualities is an important step in the evaluation of the use of goods as a mirror of social constructs. The demonstrated presence of such goods at a wide variety of site sizes and types indicates that large-scale exchange mechanisms were used by individuals and households to acquire these goods.

In archaeology the study of consumption is a logical step. While the certainty of locating production sites may be low, the probability of locating indicators of consumption is absolute. Production loci are only one small part of an archaeological landscape, and frequently occupy only a fraction of an archaeological site. From the archaeological point of view, production is a one-time phenomenon in the use-life of an object (excluding the possibility of repair), whereas consumption is an on-going process. In addition, while goods are produced by a limited range of production techniques, they are consumed in a variety of ways. Goods may be consumed by taking them out of circulation (potlatching, burial), by promoting their circulation (through trade, bridewealth, dowry, bequests, investment, or as rewards), by transforming them (e.g. from raw materials to finished products), or by static display (e.g., monumental architecture). Goods may

also be transformed into energy by "consuming" them in the literal sense, as food or medicine. The evidence for consumption is everywhere, since each site is literally composed of consumption activities, as a remnant of hundreds and thousands of acts of consumption evident in the distribution of artifacts. Moreover, production itself is founded in consumption activities, because each act of production requires the consumption of space, raw materials, and labor.

Objects, both as physical implements and as bearers of symbolic meaning, are a fundamental component of human culture. The acquisition of objects provides a way for individuals to identify themselves as members of different groups simultaneously, where the group of material referents can indicate the individual's precise role at any given moment. The concept of group identity is important in both small-scale and large-scale societies, though the emphasis is different in either case. In large-scale societies, as is shown by modern material culture studies, consumption of visible display items is a way for individuals to distinguish themselves within a group. However, consumption also provides a way for individuals to signal their achievement of group membership, a factor which may be particularly important during the periods of rapid social and political change such as those which often precede the emergence of stable political entities. In other words, the institutions of capitalism and the nation-

state challenge individuals to identify themselves as individuals, because most of the larger aspects of cultural cohesion are taken care of by the state (in forms of boundary maintenance, security, and the provision of socially-streamlining mechanisms such as imposed educational institutions). But prior to this cohesion, the challenge was for individuals to identify themselves as members of a group, to indicate legitimate participation in group approaches to environmental or social stress, where being a simultaneous member of different social groups provided increased opportunities for social survival.

The social use of material objects and their ability to communicate multiple meanings explains why trade persists in premodern societies even under adverse conditions. These observations prompt the development of a specific model for exchange activities under emergent social complexity.

### The geographic scale of exchange

The divisions between local, regional and long-distance exchange are relative, and can shift depending on the size and center of one's frame of reference. In his locational analysis of Uruk exchange systems, Johnson provides a definition of local trade as one which provides economic links within individual settlement systems, though "the exact form, extent and intensity of this movement is

not specified and may vary from case to case" (Johnson 1975:286). While the definition of intermediate trade has traditionally been the most difficult to define, it is of particular importance because it "is the exchange whose effect must have been to produce and maintain the uniformity of culture or civilization as a whole" (Renfrew 1975: 18). However, Renfrew gives little indication of how this intermediate trade should be defined or examined, though he does note that marriage-exchange is an important part of the division of groups at the intermediate level (Renfrew 1975). Others use the concept of regional or intermediate trade without defining it, seeing it as a vague counterpart of long-distance exchange (e.g., Welch 1989).

Of the three types of trade, long-distance exchange appears to be the easiest to define: long-distance trade frequently takes place at ports-of-trade, between cultural zones, where trade "provides economic links between more or less independent settlement systems" (Johnson 1975:285). Long-distance exchange is especially apparent when goods are found in archaeological contexts far-removed from their natural source. This exchange can be achieved through two mechanisms: direct exchange and down-the-line exchange. Direct exchange can be effected by individuals or corporate groups acquiring goods through a single transfer, a process particularly visible in maritime exchange (as in the Indian Ocean; see Casson 1989). Alternatively, goods may travel

considerable distances as the result of a series of local or regional exchanges. The resultant "down-the-line" exchange can mimic the effects of long-distance transport, but the possessors as they are recovered archaeologically are many steps removed from direct contact with the original source of supply (cf. Renfrew, 1975).

For the purposes of the discussion of the exchange networks of central India in the early centuries B.C. and A.D., the following definitions will be utilized. Local trade is defined as that which can be accomplished within a one-day traveling range by the fastest available means of transport. Such trade requires little infrastructure because the voyager (either trader or buyer) is not required to spend time away from home, which would entail the establishment of a lodging relationship in a non-home locus or the use of lodging facilities. Long-distance trade is defined as the exchange which takes place across geographically-large expanses where transport time is on the scale of weeks or months. Long-distance exchange may cross cultural boundaries, but the effects of such boundaries are mitigated by the presence of specialized traders who employ language and other skills in their negotiation of physical and cultural distances (Curtin 1984).

Intermediate trade will be defined as that exchange which takes place within cultural units, utilizing both the basic means of transport but often in a more efficiently-

organized manner or on a larger scale, such as caravans of pack-animals. Travel time includes nights spent away from the voyager's home and thus entails either the existence of travelers' facilities such as night-halts or caravanserais or personal relations maintained by the voyager. Intermediate trade makes use of the same transportation and communications networks as local trade, and may mimic long-distance exchange in the eventual transfer of goods far from their origins, but intermediate trade is distinct because there may be many overlapping regions of intermediate trade within a single cultural unit.

The shifting configurations of "regions" is due to their existence as dynamic entities reflecting the integration of communities into larger and smaller units in a continuing process (Smith 1976a). A trade region may share a complex of traded goods, though any individual type of good may have boundaries of distribution with a geographic range which is independent of the other goods in the cultural complex. The use of regions, rather than only centers, as units of study enables the investigation of the variable and changeable flows of goods, information, people and services through networks (Smith 1976a). The study of these networks thus involves the examination of the spread of trade items throughout a trade region. While a regional trade network utilizes the same means of transport as local exchange, the definition of a regional exchange network is based on the density and evenness of a particular complex

of goods rather than upon a specific spatial configuration.

Note that the distinction of the three types of trade (local, regional and long-distance), is here based on logistics and distance only, <u>not the types of goods exchanged</u>. This is because a good can pass through all three types of networks: even the rarest of exotica bound for distant shores must first pass through a local system of exchange. The intermediate range of travel can be duplicated by a series of strictly local exchanges which results in a 'down-the-line' mode of transfer. The use of a logistics/distance parameter reinforces the view that exchange activities are principally a matter of information and logistics, not a matter of preciosity as perceived by the (modern) investigator. Finally, the physical routes of travel and the constraints upon movement are identical whether a particular geographical expanse is being used as a local, intermediate, or long-distance route at any given period of time.

The exchange of goods is an essential characteristic of human culture, where goods are invested with both physical properties and socially-constructed value. It is proposed that population loci of all sizes contain individuals who use material goods to identify their status with respect to the inclusive social groups which regulate life-cycle as well as daily activities. As social complexity increases, the number of groups increases (and usually, the population), so that communication about

individual status and group identity becomes most effectively communicated through material objects which serve as a frame of reference for language-based interaction. Thus exchange, not only of goods but of the information which accompanies economic interaction, is an essential and integral element of increasing social complexity. When political conditions permit, trade is facilitated by administrative and capital investment; when political conditions do not permit, there is the continuation of smaller-scale trading mechanisms which allow continued economic interaction.

### A proposal for exchange in emergent complex societies

It is proposed that under the following conditions:

1) A variegated, unpredictable landscape where
2) There is a lack of unifying political or other large-scale social cohesive mechanism to overcome the limitations of the landscape (e.g. through redistribution of subsistence goods), AND
3) There is a lack of technological conditions which facilitate large-scale communication, transportation or resource production (e.g. canals, railways, roads),

Then:

One would predict multiple small-scale ties across the landscape to ensure individual and family-based survival during times of environmental hardship, where such hardship is characterized by famine, natural disasters, or war. Individuals, both buyers and sellers, would form traveling groups to overcome limitations of a hostile political or

natural landscape, and would be flexible in their choices of routes and travel times. Local itinerant merchants could also move around the landscape filling in the gaps of small needs (ornaments, metal goods), as well as providing repair. The itinerant merchants would also facilitate down-the-line transfer of non-local goods, as well as dispersing information about routes.

The movement of people around the landscape would be facilitated by the use of physical markers of shared social constructs, such as ornaments and modes of dress. Population loci would also contain physical markers of shared culture, in both public and domestic spheres, where goods and architecture would provide essential frames of reference for non-inhabitants. Some of these social constructs, such as religious institutions, might well evolve a bureaucratic or administrative structure and accumulate capital as a corporate group to address limitations of the landscape, where corporate powers of enforcement and investment were greater than that of single individuals. When goods are seen as the material correlates of social activities, then all goods are acknowledged to be invested with social symbolism. When environmental or social conditions dictate contact with neighboring kin groups, then traded goods from those regions become important symbolic factors for individuals and families seeking to display those ties through their everyday activities.

## Application of the proposal

The preceding proposal will be evaluated with reference to the Early Historic period (c. third century B.C. to fourth century A.D.) in central India, where archaeological and historical documentation indicate a thriving trade in both display and domestic goods. These exchanges took place at a time when there was no centralizing bureaucratic entity in the subcontinent, and the political landscape was composed of dynasties strengthened by short-term alliances and with consequent shifting control over people and resources. This data set was chosen to examine the role of trade activities in maintaining social cohesion throughout a long period of political instability. The following chapter details the history of the region, while the remainder of the work focuses on a study of trade activities at the site of Kaundinyapura.

# CHAPTER IV

# THE HISTORY OF CENTRAL INDIA

The preceding chapters have discussed the role of material goods in social context. An archaeological case study was sought to evaluate the proposition that trade is an important component of social structure and that the desire for goods prompts the continuation of exchange even under adverse political circumstances. An appropriate test case required two conditions: evidence for a similar material culture over a large geographic area, and evidence that political cohesion was weak or fragmented. These two conditions were met in central India of the "Early Historic" period, beginning around the third century B.C. and continuing until the fourth century A.D.

This chapter offers a general historical outline for central India from the megalithic period to the medieval era. As will be shown, many historical events and changes affected large portions of the subcontinent; this enables the use of a wide variety of source materials to elucidate the events and trends of historical activities in central India, which is not as rich in documentary sources. The emphasis in this chapter is upon the political and economic conditions of each period, as presented through the

literary texts and archaeological data which form the basic source materials.

## The later prehistory of central India

By around 1600 B.C., agricultural villages were established in central India, as indicated by the extensive excavations in western India at sites such as Maheshwar and Navdatoli by H.D. Sankalia (Sharma 1991). The chalcolithic period is estimated to have begun in central India c. 1300-1000 B.C., and is characterized by the presence of copper artifacts, lithics and distinctive painted wares as recovered at key sites such as Jorwe, Nevasa, Chandoli, Daimabad, Bahal, Songaon, Inamgaon and Prakash (Deo 1985). In particular, the excavations at Inamgaon have provided an opportunity to examine changes in material culture and architectural styles over approximately 900 years of occupation (Dhavalikar, Sankalia and Ansari 1988). During this span of occupation, the inhabitants of the site consumed domesticated wheats, lentils and other foodgrains as well as wild and domestic animals (Dhavalikar and Possehl 1974).

## The megalithic period

Overlying chalcolithic archaeological deposits appears a material culture assemblage which contains significant

additions to the artifactual repertoire, in the form of iron objects and a distinct black-and-red ware ceramic. Sites containing this material-culture complex often also contain substantial funerary architecture in the form of standing stones, dolmens, cairn circles, and other elaborate tomb types which give the term "megalithic" to the material-culture complex. The appearance of megaliths appears to be restricted to the southern portion of the Indian subcontinent, with the Vidarbha region (in eastern Maharashtra state) being its northernmost extension.[1] Eastern Vidarbha is particularly rich in megalithic monuments, with well-known excavated examples such as Junapani, Mahurjhari and Khapa.

Although the chronology for the megalithic period can only be suggested due to the relative paucity of absolute dates, a few C14 dates help to bracket the occurrence of the megalithic in Vidarbha. At Takalghat, a C14 date suggests that the beginning of the megalithic habitation can be placed around the 7th century B.C.; to the southwest at Hallur, the C14 dates for the neolithic-megalithic transition are placed in the mid-10th century B.C. (Deo

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[1]Considerable amounts of archaeological fieldwork has taken place in western Maharashtra and the negation of any megaliths further to the north is widely accepted. In a recent article, however, S.B. Deo suggests that megalithic tradition in Maharashtra need not be strictly limited to Vidarbha, as there are mentions of large-stone monuments at Ranjala and Tekwada in the Tapti-Girna valley (Deo 1985:24).

1985). These radiocarbon dates bring into question the very early dates assigned to the Kaundinyapura megalithic period based on stratigraphy alone (see Dikshit 1968; critique by Deo 1985).

The terminal dates for the megalithic period are often based upon the assumption that the activities of a subsequent "early historic period" eliminated the construction of megaliths. In southern India, however, several sites contain evidence that the use of ceramics associated with megaliths continues into the early centuries A.D. (Gurumurthy 1981). In Vidarbha, there are also indications that the construction of megaliths may have continued into the first millennium A.D.[2] Significantly, the locus of megalithic constructions appears to have achieved a syncretism with later religious developments, as seen at sites such as Amaravati, where the presence of Buddhist stupas in proximity to megalithic constructions "point(s) to continuity in areas regarded as sacred and associated with the dead" (Thapar 1992:24). Examples of this phenomenon include the site of Yelleswaram (Nalgonda district, Andhra Pradesh), where a megalithic burial was recovered under a brick stupa (IAR 1960-61:3).

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[2]Deo's (1972) observation that the early historic settlements at Mahurjhari are not adjacent to the stone circles at that site does not preclude the contemporaneity of the two portions of the site. At most sites where there is both megalithic habitation and megalithic tomb-architecture, the two elements of the site are separated.

Similar parallels are noted at the site of Deur Kothar in Madhya Pradesh (Nagayach 1990).

## The Mauryans and central India

Also significant for the history of central India in this period are the activities of the Mauryan polity in the Gangetic plain to the north, which experienced a brief, expansive florescence during the reign of the ruler Asoka in the late third century B.C. This polity is primarily known from the distribution of impressive rock-cut inscriptions and edicts set forth by the ruler Asoka (Thapar, 1961). The presence of these inscriptions has often been taken to indicate the boundaries of the Mauryan polity and the centralized control of a vast amount of territory.[3] However, the political conditions and conflicts of this period probably mean that the spread of

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[3]An example of the interconnected assumptions is given by Deo and Joshi: "It is a fair assumption that the territory of Vidarbha lay under the domination of the Mauryan rulers. The limits of the Mauryan Empire under Asoka are generally indicated by the inscriptions which were set up on its borders. Of these, we find one pillar edict at Maski in Andhra Pradesh. This indicates that the territory of Vidarbha lay well within the Mauryan empire" (Deo and Joshi 1972:11). Fussman makes a similarly extreme statement: "...the borders of the Mauryan Empire coincided with the natural borders of the peninsula and except in the extreme south where some kingdoms preserved their independence...the frontiers of the Mauryan Empire are more or less known by the location of Asokan inscriptions" (Fussman 1987-88:43-44).

Asokan edicts represents an area of maximum contact, rather than an area of streamlined bureaucratic control.

There are indications of Mauryan contact in central India, as shown by the presence of Asokan inscriptions such as the one at Deotek, in Chanda district (Deo and Dhavalikar 1968). Asokan inscriptions are found in the gold-bearing regions further south near Mysore (Ray 1987-88); there is also the appearance of an Asokan inscription in Kalinga, to the east (Sherwani 1977). Archaeological evidence for contact with Gangetic peoples in central India is limited to a few sherds of the striking black fineware known as Northern Black Polished ware whose main distribution is in the Gangetic region. The presence of this ware at an early date in sites such as Pauni, and later at Kaundinyapura and elsewhere, indicates that Vidarbha was the conduit through which this ware passed to the south, since there are no occurrences of NBP on the eastern coast (Deo and Dhavalikar 1968:60). But the quantities of these Gangetic wares in sites of central India are exceedingly rare, so that the overall impact of Gangetic peoples and the Mauryan polity in particular upon the central Indian political landscape appears to have been relatively slight.

Other sources of information about the contacts between Gangetic peoples and those of Vidarbha are found in literary documents, although these considerably postdate the action described. After the death of Asoka c. 236

B.C., the Mauryan dynasty continued to reign though in a weakened state; it was finally overthrown by Pushyamitra Sunga c. 185 B.C. according to the Puranas (Mirashi 1981). However, the story of Pushyamitra Sunga's expansionist efforts and his struggle with the ruler of Vidarbha are first known through the texts of Kalidasa, which probably date to the 4th century A.D. (Rao 1982[1960]; see also Mirashi and Navlekar 1969). In both literary and archaeological sources, the scant evidence for the impact of Gangetic peoples in central India precludes the useful application of the label "Mauryan period" for central India.

In the Ganges region after the brief dominance of the Mauryans, several "small States" arose in the northern part of the Indian subcontinent (Mirashi 1981). The increasing use of writing in this period, through inscriptions and coinage, enables the identification of numerous emergent polities throughout the subcontinent. Significant population movements and political developments were also occurring at the northwestern margins of the subcontinent. After the Parthian revolt in 250 B.C., western Asia's power vacuum was filled by the kingdoms of the Indo-Greeks whose sphere of rule, mostly attested through coin finds, appears to have been as far east as Taxila (Narain 1957). Towards the second century B.C., movements of nomadic peoples in central Asia began to impact the weakening Indo-Greek kingdoms, and displaced the Scythians of the Aral Sea

region; these Scythians (Sakas) overran Parthia and settled in western India (Thapar 1966).

One of these nomadic groups, the Kushanas, presided over an era of urban prosperity in the central Asian territory and northwest India, as seen in a number of excavated town sites (Liu 1988). The Kushana king Kanishka, ruling from the area around Peshawar (beginning c. 78 A.D.) expanded administrative control by appointing a number of satraps (administrators) to govern the conquered portions of Saka-occupied areas in the western and northern subcontinent (Mirashi 1981). Historical evidence (texts, coins and inscriptions) indicate that these Sanskrit-using "Kshatrapas" expanded eastwards at the expense of the Satavahanas, with their first entrance into the Ujjain region in 66 B.C. (Jain 1964). However, these territorial gains were often temporary, as strong rulers rose in alternate generations to push back the encroaching neighbors (Mirashi 1981). Figure 4.1 illustrates the interactions between some of the larger known polities in the subcontinent around the first century A.D.

In addition to these larger-scale political changes which saw cities taken over by various rulers, smaller-scale political consolidations are also evident throughout the subcontinent, if one can take numismatic evidence to indicate new centers of political strength. The propensity for local rulers to issue their own coins is evident for both Kshatrapas as governors of smaller entities and in the

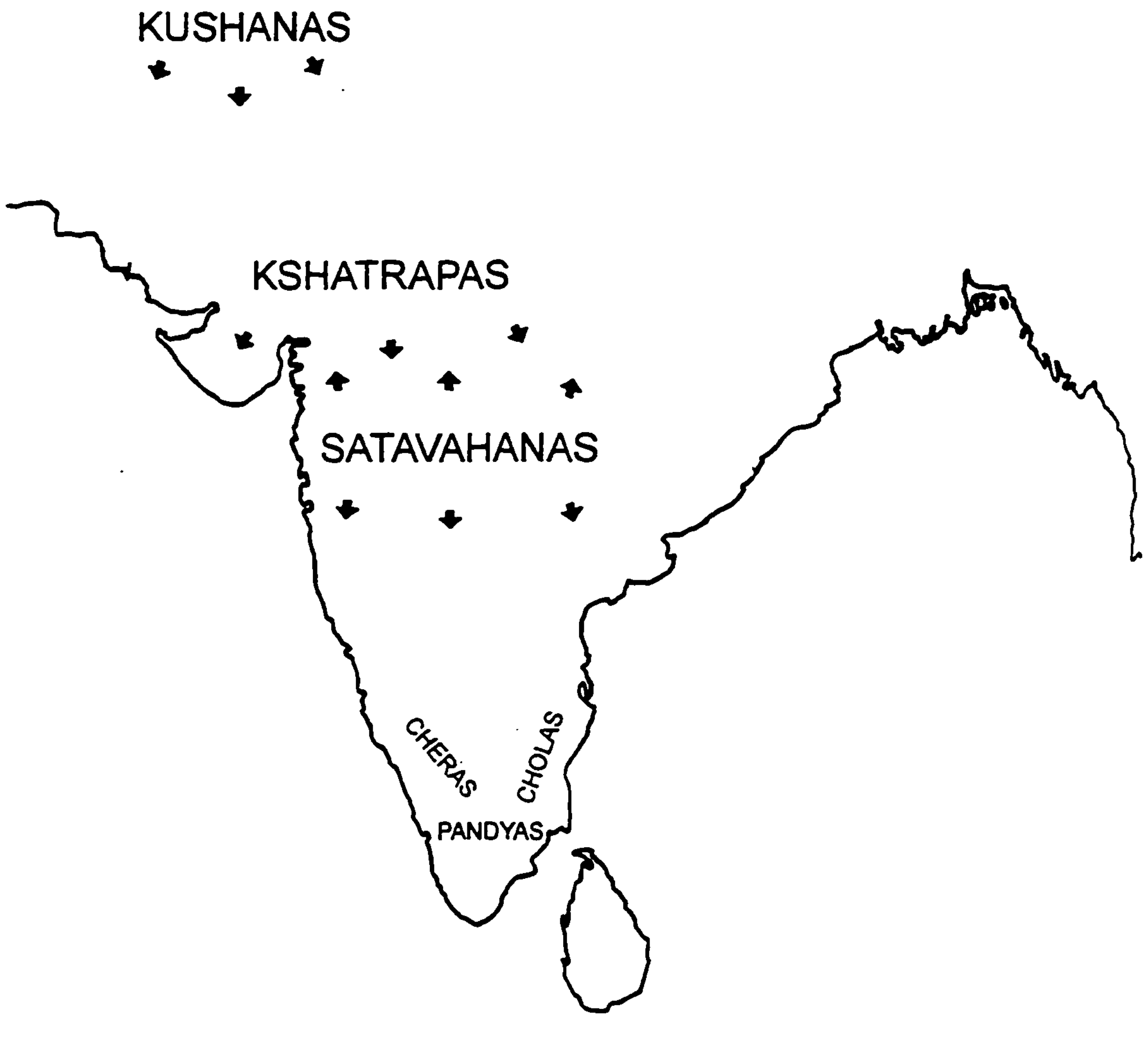


Figure 4.1. Major known polities of the first century A.D. in the Indian subcontinent

regions of the Satavahana kingdoms (Mirashi 1981; Thapar 1966). Contemporary literary evidence from the West also indicates that there were numerous small polities active in this period. The Periplus of the Erythrean Sea, a Mediterranean merchant's document of the late first century A.D., states that the hinterland east of the west-coast port of Barygaza "contains many barren areas...as well as a great many populous nations up to the Ganges" (Casson 1989:83). In sum, the several centuries between the large-scale, but briefly held, Mauryan polity and the Gupta state which emerged in the 4th century A.D. was a time of warring, expanding and contracting political entities in the central Indian subcontinent.

## The Satavahana dynasty

In the central-western subcontinent, the Satavahana dynasty, with their capital at Pratisthana (Paithan), was established by the first century A.D. (Rao 1982[1960]). Although the Satavahanas are the best-known, and were probably the most well-organized polity of the early centuries A.D. in western India, there are significant unresolved controversies about their origins. Because the Satavahanas are also known in early texts as "Andhras", there is some disagreement about whether the Satavahanas originally came from the area of what is now modern Andhra Pradesh (for explication, see Mirashi 1981). The majority

of researchers currently maintain that the Satavahanas were originally from the western subcontinent, but acquired the epithet "Andhra" after they had shifted their political focus to the east around the second century A.D. (e.g., Mirashi 1981; Sarkar 1987; Wayman and Rosen 1990). However, the relative paucity of documentary evidence related to the origins, political organization and territorial extent of the Satavahanas has led at least one prominent scholar to concede that "everything about them is controversial" (Dhavalikar, 1985:29).

Archaeological evidence at present sheds little light on these unresolved questions. A number of shared cultural and iconological elements are present throughout the subcontinent in this period, principally in the form of Buddhism, which certainly suggest contact between the western subcontinent and areas to the south and east. As noted above, the area of Vidarbha is the northernmost location of the megalith-building tradition of the south, suggesting that this part of central India may have hosted many cultural traditions in a vibrant syncretic cultural environment. Other cultural practices in Vidarbha may indicate links to southern India, as Trautmann (1981) indicates for the kinship relations of the Satavahanas.[4]

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[4]The combination of northern and southern kinship practices in modern Maharashtra is also noted by Karve (1968).

While the movements and structure of the Satavahana polity are complex and disputed, some basic information about chronology and activities is available from the documentary sources. By about 80 A.D., the Satavahana king Gautamiputra Satakarni is credited with holding vast dominions, including the area of eastern Maharashtra known as Vidarbha (as known from an inscription at Nasik; Bajpai 1967).[5] However, the self-identified association of territory with a ruling family probably did not encompass direct administration given distances and costs. Evidence specifically from Vidarbha indicates that local kings continued to rule; for example there is a stone inscription of the Bhara king Bhagadatta from the site of Pauni dating to the second century A.D. (Mirashi 1963).

The interactions between centralizing polities such as the Satavahanas and local groups encompassed a variety of ruling strategies. Strategic intermarriages between contesting groups, such as the one between the Satavahana ruler Vasisthiputra Pulumavi and the daughter of the Saka king Rudradaman, served to dissipate tensions, if only

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[5]The chronology of the Satavahana period is complicated by the apparent simultaneous use of different years by the various ruling families of central and northern India. As a result, many different dates have been proposed for Gautamiputra's reign, from c. 40 BC to AD 124; Rao favors 62-82 A.D. (1982[1960]:91), while Mirashi proposes a date of c. 125 A.D. for Gautamiputra's invasion of Vidarbha (Mirashi 1981). For a discussion of the historical source material, see Jain 1964; Mukherjee 1973).

temporarily; after Rudradaman's defeat of the Satavahanas, this Pulumavi was installed as king over portions of the Western Andhra domain (Rao 1982[1960]). Outright conquest is also evident, as in Gautamiputra Satakarni's conquest of Ujjain.

The costs of administering large territories suggest that polities successfully experimenting with socio-political complexity in this era were principally focused upon internal organization rather than territorial expansion. The main investments undertaken by the Satavahanas appear to be cities and monasteries, with few forts being constructed in this period (Kamalapur 1961). The Satavahana capital at Paithan was seconded by a large urbanized population center at Ter; the emphasis upon cities is also reflect in the importance of ports such as Barrukacha (Broach) on the Arabian Sea, and by the role of population centers in their territorial contests as illustrated by their capture of Ujjain.

These conservative ruling strategies find parallels in other portions of the subcontinent at the same time period. In a study which examines the development of kingly ritual among the Pallavas in southern India (1-2nd century B.C. to 10th century A.D.), N. Dirks sees a diversification of the kingly authority to include "chieftains" (Dirks 1976). In abstracting from the specific data on the Pallavas, it appears that as an expanding dynasty succeeds in becoming a larger regional entity, other local rulers are incorporated

into the royal ritual sphere. By doing so, they could give gifts (i.e. to temples) on behalf of the king, and could claim god-like comparisons of their own actions in the local sphere. The everyday bureaucratic and economic role of these local rulers however appears quite limited; even with respect to warfare there does not appear to have been a permanent incorporation of local leaders, rather, "the army was run on a decentralised basis, and only coalesced at the royal level for wars of a predatory or defensive sort" (Dirks 1976:154).

The last of the Satavahana kings, Pulumavi IV, is known through a stone inscription at Adoni in the Kurnool district of Andhra State; after his fall from rule in the middle of the third century, "several small kingdoms appear to have risen in the different provinces which had previously been under his sway" (Mirashi 1963:xvii). To the west of Vidarbha, the last of the Satavahanas was overthrown by the Rastrakuta king around the end of the third century A.D. (Kamalapur, 1961).[6] The decline of the Satavahana polity, like the decline of the Mauryan polity, was accompanied by a resurgence of local dynasties

[6]The last dynast of the Rastrakuta line was defeated in the sixth century A.D. by one of the Chalukya rulers, "who thereby established the sovereignty of the Chalukyas over the Deccan in the early part of the sixth century" (Kamalapur 1961:7).

and political entities.[7]

### The resurgence of centralized polities in the fourth century A.D.

The names of many of the larger successor polities to the Satavahanas are known through the dynastic lists of the Puranas, as well as through inscriptional evidence. The next dynasty of any size documented for the Vidarbha region was that of the Vakatakas in the late third century A.D. The establishment of the Vakataka dynasty's supremacy over subordinate peoples was accomplished through the conquest of former Satavahana lands which had lapsed into the control of local functionaries; this absorption of territory began with the second named ruler of the Vakataka line, Pravarasena I (275-335 A.D., Altekar 1982[1960]a).[8] The cultural affiliation of this region tended to be

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[7]As indicated above by the inscription of the local king Bhavagatta, the era of "Satavahana" rule may reflect the imposition of a bureaucratic superstructure upon a series of relatively autonomous local polities. The writing of the history of the Satavahanas, in overemphasizing the strength of that bureaucratic superstructure, may thus exaggerate the complexity of the Satavahanas to enable it to compare favorably with states to the north and south (Parasher-Sen 1993).

[8]The chronology offered for the Vakatakas here is based on Mirashi (1963) and Altekar (1962). However, the limited dated historical evidence for this period has resulted in some disputes over chronology. For example, there is another chronology which gives dates about 30 years prior to those given by Mirashi and Altekar (Spink 1992).

northward-looking, with Vidarbha characterized as "the southernmost outpost of the interrelated dynasties of the northern Sanskrit-speaking people, (a) characteristic apparently continued during the historical period, inasmuch as all the Vakataka inscriptions are in Sanskrit" (Karve 1968:57).

The original home of the Vakatakas, though disputed, is thought to be located near the famous Buddhist site of Amaravati (Altekar 1982[1960]a). Later capitals included a site within 60 kilometers of the modern city of Nagpur (at either Nandpur or Nagardhana); it has been suggested that this site was chosen as the royal capital because of the proximity of nearby forts such as at Ghughusgadh and Bhivgadh (Mirashi 1963:xxiii). A third new capital city was founded by Pravarasena I (275-335 AD) which has been identified at Paunar, about 60 kilometers southwest of Nagpur (Altekar 1982[1960]a; Mirashi 1963). The family deity of the Vakatakas was also located at Ramtek, indicating that the Vakataka dynasty was strongly associated with the Vidarbha region.

The strategy of rule included the divisions of the ruling family into two principal branches beginning with the successors to Pravarasena I in the fourth century A.D. (Mirashi 1963). The presence of competing polities is evident both in the existence of forts and the inscriptional evidence which shows rival dynasts' claim over Vakataka territory. It appears that the Rastrakuta

family, influential in the downfall of the Satavahanas, also made inroads on territory held by the Vakatakas, annexing territory to the south of the Godavari river which had previously been held by one of the sons of Pravarasena I (Mirashi 1963:xxix). Some of these rivals made their presence felt even in the principal towns claimed by the Vakatakas. For example, a mid-fifth century copper-plate grant, issued at Nagardhana itself, documents the donation of a village in the Yeotmal district by the Nala king Bhavadattavarman (Mirashi 1963).

At the same time that the Vakataka dynasty was expanding, the Guptas came into power elsewhere in the Deccan. In a process similar to the way in which the Vakatakas had expanded their territory, the Gupta ruler Samudragupta "eventually brought under his own sphere of influence the different kings in Chota Nagpur, Bundelkhand, Baghelkhand, Chhattisgarh, and the Andhra country, who formerly had been the vassals of the Vakatakas" (Altekar 1982[1960]a:165). Altekar suggests that at this point, the Vakatakas themselves may have been subordinate to the Guptas, though the death of Budhagupta in 495 A.D. allowed a re-expansion of Vakataka control (1982[1960]a).

As in previous periods, the political landscape was populated by a number of territorially-small, family based political units which can be identified as dynasties. Rather than characterizing these dynasties as rivals--which implies that there in fact a condition of constant warfare-

-it is perhaps more accurate to identify these political units as "peer dynasties" (cf. Renfrew and Cherry, 1986). The term "peer dynasties" as used here serves to define a series of central authorities of equal size, between whom there was a potential for conflict not always acted upon. Relations between peer dynasties could be achieved by a series of treaties and other conciliatory mechanisms such as marriage alliances (e.g., the union between Chandragupta II's daughter Prabhavatigupta and the Vakataka king Rudrasena II c. 390 AD) (Altekar 1982[1960]a). However the interactions between two regional dynasties could easily change from parity to dominance, as it did when the death of Rudrasena II converted the Vakataka realm into a regency under the royal Gupta daughter Prabhavatigupta (Altekar 1982[1960]a; Mirashi 1963).

The periods of dominance were characterized by the incorporation of former peer dynasties into a support system for the expanding, and centralizing, conqueror dynasty. The continued exercise of local control by the former peers--now subordinates--meant that the expanding dynasty's control over territory was therefore either short-lived, or weak. The relationship of the subordinate rulers to a central dynasty such as the Vakatakas is indicated by the descriptions of three types of "feudatories" in the Vakataka grants: those who submitted while threatened, those who submitted on being attacked, and those who were overtaken through warfare (Mirashi 1963).

The exact nature of their tribute, and whether it varied depending on the amount of force exerted before submission, is unknown; their obligations to the conqueror however appears to have included military assistance.[9]

This military assistance could be utilized by the centralizing dynasty in several ways: to protect its newly acquired territories, to collect new territories, or to ward off other centralizing polities. During the time of the Vakataka expansion in the early 4th century, the Gupta polity to the north was also expanding. Most historians indicate that the Guptas were the more powerful expansionist polity; much, however, depends on the reading of the source material which often is based on historical documents sponsored by an ascendant political entity.[10]

The Vakatakas experienced a renaissance under the ruler Harisena, who was responsible for initiating large-scale cave constructions at Ajanta (Spink 1992). The Ajanta inscription which describes his political conquests indicates that territories to all sides were subdued by Harisena, as far as Malwa in the north and Kuntala in the

[9]For example, "In the eighth Uchchhvasa of the Dasakumaracharita, the feudatories of the king of Vidarbha come to his help when he was attacked by the ruler of Vanavasi." (Mirashi 1963:xxxvii).

[10]Spink, for example, argues for the greater strength of the Vakatakas, whom he sees as transcendent after the decline of the Guptas following the death of Skandagupta in about AD 467 (Spink 1992).

south, and to both sea coasts; however, his conquests "do not seem to have resulted in the permanent annexation of this vast territory" (Mirashi 1963:xxxi). Contemporary inscriptions reveal that this brief fluorescence of the Vakatakas did however have a considerable impact on the surrounding polities: Harisena conducted a marriage alliance with the Vishnukundin dynasty to the south, and the period of his reign coincides with the beginning of new families in Kalinga (to the east) and in Kosala (to the north) (Mirashi 1963).

After the rule of Harisena, the Vakatakas began to lose control of their territory as new regional powers emerged. By around 540 A.D., three peer dynasties (the Kadambas of Karnataka, the Kalachuris of northern Maharashtra, and the Nalas of the former Bastar polity) succeeded in absorbing most of the Vakataka territories during the rule of Harisena's successors (Altekar 1982[1960]a:191). Of these three, the Kalachuris appear to have had the most widespread impact, with their coins being found throughout the central-western subcontinent by the late 6th century (Mirashi 1963). Their strategy of rule, like the Vakatakas before them, appears to have been based upon the use of local rulers. Copper plate grants issued by one Svamiraja from the former Vakataka stronghold at Nandivardhana in the Kalachuri year 322 (573-74 AD) indicate that Svamiraja was "probably a feudatory of the Kalachuri (ruler) Krishnaraja" (Mirashi 1963:xxxii). At

the same time, the rapidly-expanding Chalukya polity in the south exerted pressure upon neighboring entities, so that by 565 they dominated the greater part of the territory that had been included in the Vakataka polity (Altekar 1982[1960]a:189).

**The early medieval period (7th - 12th centuries A.D.)**

The medieval period is often characterized as that which falls between the end of the Gupta polity in the seventh century A.D. and the appearance of the Mughal empire in the northern portion of India, but the application of the label "medieval" is rarely consistent.[11] An increased repertoire of documentary sources permits a more thorough investigation of economic and political conditions; at the same time, there has been much less attention to archaeological materials of this period aside from architectural constructs. As a result, the medieval period is one which receives less attention than the underlying deposits on most archaeological sites.

To examine the types of political and economic interaction which may have taken place during this period, one can look to other portions of the subcontinent to

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[11]The use of the term "early medieval" is a relatively recent attempt to divide this long and complex historical period into distinct temporal entities (see Yarlagadda 1993).

determine the maximal amount of local control by well-established political entities, with the assumption that the political structure in Vidarbha (with its lack of centralized cities) did not exceed its neighbors' in complexity.

In northwestern India there were over 100 "regional kingdoms and petty principalities" by the beginning of the eleventh century; these polities are characterized as having shifting boundaries and territories which fluctuated during the course of continuous warfare (Mehta 1986:29-30). The Rastrakutas, former feudatories of the early Chalukyas, originally came from the area of Latur district, now located in south-central Maharashtra state (Altekar 1982[1960]b:250). They established their rule in the Deccan in 753, and ruled there until they were overcome by the later Chalukya dynasty in 973 A.D. (Mehta 1986:37).

Considerable economic changes are signalled in the land grant and temple grant documents of the period. In the broad area characterized as the Deccan in central India, one scholar has interpreted a change in property holdings as a movement towards a system of individualized, private property (Parasher-Sen 1993). This development of individual land rights had several important implications: the social hierarchy began to be tied to the control over landed property exhibited by different groups and individuals, with individual rights increasing as agrarian production forces became more closed (Parasher-Sen

1993:243). As land became associated with particular owners, land grants became a way to make donations to religious institutions (principally brahmanical temples) (Yarlagadda 1993).

Production increased with land-improvements such as water-tanks, while "the beginnings of bonded labour in the eighth century A.D. coincides meaningfully with the expansion of private farms, improved techniques of agriculture and an increase in crop production" (Yarlagadda 1993:175). However, it should be noted that the development of individualized property did not result in single-proprietor rights of usage; the changes in property ownership were accompanied by a proliferation of different types of use-rights, including tenancy rights which could be maintained even when the ownership of the land changed.

While donations to religious institutions were made by both high-ranking individuals of the ruling families as well as lesser leaders, the proportion of gifts by lesser individuals increased throughout this period (Yarlagadda 1993). This development occurred at the same time that temple-construction spread beyond the most fertile areas to less fertile districts; temples in less fertile areas were supported by lesser chiefs and feudatories, who contributed money for rituals. This caused (or rather, reflected) the increased importance of the priestly office while downgrading other individual temple functionaries (Parasher-Sen 1993).

In the southern subcontinent, the fragmentary nature of political control is indicated both by the relations between polities of equal strength (e.g. "peer dynasties," as described above), and between the administrative or bureaucratic centers of those polities and their surrounding hinterland. Contests between polities took place in a landscape without fixed territorial boundaries, so that the area of control was constantly subject to reconfiguration as the balances of power shifted from one polity to another. Nor was the governance of a polity uniform throughout its conquered domains; the changes which a conquering group was able to effect depended "on distance from the centre of the polity and on the military strength of opposing monarchs" (Heitzman 1987:48).

During the Chola period (850-1279 A.D.) in southern India, there was a constant conflict between local organizations and representatives of the central bureaucracy (Hall 1980). These local organizations included population centers, and a number of different bodies which grouped those population centers together: the Brahman village assembly (sabha), the locality assembly (nadu), the non-Brahman village assembly (ur), and the multi-village landed groups (nattar) (Stein 1975). There were many cross-cutting organizational entities, but the defense of local interests resulted in a "lack of links between local networks and formal institutions" (Stein 1975:79).

Rather than being a consistent presence throughout the countryside, the "kingly presence" was most pronounced in the central places of the Chola polity, which were also endowed with irrigation agriculture (Heitzman 1987). Centralized control over resources, whether political or religious, was thus most strongly manifested--and commemorated--in the physical vicinity of the controlling entity.

### The later medieval period (thirteenth-eighteenth centuries A.D.)

The activities of the Delhi sultanate in the northern Gangetic plain and in the northwestern subcontinent had variable impacts in the central subcontinent. In 1306-07, the Delhi sultan Ala-ud-din sent his general Malik Kafur to invade the four weakened Deccani kingdoms of the Yadavas, Telingana, Dwarasamudra and Mabar (Singh 1978). Being too far from the center for direct rule, the conquered territory was maintained as tribute-paying kingdoms until the death of the sultan, at which time they reasserted their independence (Singh 1978). Sites occupied in this period in Vidarbha include fortified towns such as Paunar, which contains inscriptions of both the 14-15th and late 16th centuries, the latter of Burhan Nizam Shah II (Deo and Dhavalikar 1968:1).

The principal agents of change in the Indian

subcontinent were the Mughals, ruling from Delhi from the 16-18th centuries. They ruled as the successors to a long series of invasions, occupations and adminstrations carried out by peoples of the northwest. The principal constructs of the Mughal empire, including splendid architecture and bureaucratic impositions, often masks the compromised nature of the bureaucratic structure and the fragility of the many alliances which were maintained both at the center of power and with the competing polities who formed the boundaries of the administration.

Central India was touched upon by much of the interaction between the Mughals and local dynasties including the Marathas and the Nizam of Aurangabad (later, of Hyderabad). The historical sources are more revealing of the activities of these larger polities, as they encroached upon central India, than of the regional dynasties which held this area. These regional dynasties, themselves relatively large in the territorial extent claimed by their political centers, included Gondwana (to the east) and Berar (to the south; see figure 4.2). The Gondwana area appears to be a zone rather isolated from the rest of the peninsula; owing to the difficult terrain and distance to their sources of supply, the Mughals were never able to pacify this region despite several attempts (Deloche 1980).

In the area of Nagpur, the major house to emerge from the rivalries among the Maratha chiefs were the Bhonsles,

Figure 4.2. India in 1561 (from Dikshit 1986:3)

who ruled at Nagpur starting around 1720. This arrangement was initially an agreement on the part of Raghuji Bhonsle to supply a fixed quantity of soldiers in support of the Maratha ruler in western Maharashtra; however, Raghuji utilized this force to his own advantage with increasing success (Gordon 1993:124). Raghuji's possession of troops permitted him an independence from the principal Maratha administration and enabled him to pose a challenge to the center; this type of independence by allied polities was a constant in the administration of all of the large polities which emerged in central India, including the Mughals as well as the Marathas. On the smaller level, each of these allied polities in turn had to coerce recalcitrant local groups within their sphere of influence. Characterized as "local armed lineages", these local groups resisted taxation and the superimposition of a bureaucratic structure (Gordon 1993).

While little direct information about local lineages and local economic conditions is available for the Vidarbha area, the structure of local opposition can be seen from areas to the west. In Malwa (to the northwest of the study area) in the 1720's, the Marathas conquered territory previously held by the Mughals and were presented with the prospect of transforming their raiding activities into an administrative structure for the collection of revenue. The Maratha ruler, Bajirao I, initially instituted a program of "specialized tribute" which consisted of an

agreement with a local armed lineage (Gordon 1993). However, this system was unsuccessful, largely because the local lineages themselves lacked comprehensive control of the countryside: some areas had local leaders who controlled 15-100 villages, but "other areas had no functioning local administration above village headmen." (Gordon 1993:140). The Marathas and their allies did expand to the east and north and penetrated the thick forest cover of the Vidarbha area, but the difficulties of administration meant that Vidarbha probably contributed little to the treasury and was instead a drain on resources.

The presence of strong, locally-based entities was characteristic of the areas to the south of Vidarbha as well. The 16th-century Vijayanagara polity, based in Karnataka, was dependent upon local functionaries whose cooperation was necessary for the extraction of revenue and war-supplies. These "lords and lordlings of the soil," largely nepotistic and locally-oriented, interacted directly with central authorities (Frykenberg 1979a:231).[12] Examination of the Vijayanagara polity also

[12]In a companion article, Frykenberg isolates the exact mechanisms of subversion of central government authorities in the early 18th century under British rule: classifying land as "waste" then cultivating it, undervaluing land, "returning" land to the indigent community so that the real owners' wealth was essentially hidden, short counts of government grain, etc. (Frykenberg 1979b).

illustrates the presence of overlapping economic and political agencies, in that artisanal caste-guilds cut across nadu (market-zone) boundaries (Ramaswamy 1985:431). Continuing the trend of the previous period towards a greater community role of temples, there was a growth in the quantity of lands held by temples and an increase in the economic role of temple functionaries. While gifts to temples increased the social prestige of the donor, it also increased local agricultural output, as temples often financed large-scale irrigation projects and other agricultural improvements (Stein 1960). In sum, political administrations were only one of several different kinds of regional organizing mechanism.

Central India, though affected by developments elsewhere, did not permanently become a part of the larger expansionist states to the north and south. One marker of this is the lack of road-networks in central India compared to the more well-traveled Gangetic plain; Deloche attributes this to the fact that the area was never fully conquered by the northern powers (Deloche 1980). The conditions of this underpopulated territory are reported in the writings of an early traveler to the region, who noted in 1793 that the area between 17° and 20° in Berar was "either too desert, or too savage, to be easily or usefully explored" (Rennell 1976[1793]:373). A lack of fixed transit-points is seen in the varying itineraries of travelers to the south, in comparison to the catechism of

fixed points traversed by visitors to the north (Deloche 1980).[13]

All of these indicators of a low volume of traffic are however largely predicated upon the European use of the area, which was infrequent due to the perceived lack of riches to be found in the central subcontinent.[14] European sources do refer to the large-scale commercial traffic between Surat, Hyderabad and Macilipattanamu, which would of necessity have passed through the Vidarbha region (Deloche 1980). In addition, there appears to have been a significant traffic between holy places in Gondwana, which attracted pilgrims and saints; a link between northern and southern pilgrimage routes was the town of Bhandak (due south of Nagpur; Deloche 1980). A trade in salt is also attested towards the East coast sites of Ganjam and Sri Kakulamu, though the exact routes are unknown (Deloche 1980).

The political organization evident at the centers of

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[13]A lower population density, and the lack of long-settled cities such as those found in western and northern India may also have precluded the recitation of itineraries, which in the north were largely focused on the connections between significant towns.

[14]As will be seen in chapter ten, a perception of wealth did develop in the 1860's when cotton began to be grown in this area for shipment to British mills. A massive investment in transportation and communication facilities was quickly undertaken, transforming central India into a major transit point from the colonial point of view.

contemporary polities indicates that there was the potential for political agents to control and derive revenue from economic activities. The interdependence of centralized bureaucracies, provincial allies, locally armed lineages and villages suggest a hierarchy of organization which could be effectively utilized to move agricultural produce to any consuming center, either religious or political. Both physical transit routes, and networks based on kinship, economic relations and religious ties could facilitate the transfer of produce (e.g. to feed and provision armies and support the bureaucratic mechanism) and to move rewards and symbols of authority from the center to cooperative leaders. In practice, however, any hierarchy was the result of a constant process of negotiation, in which members of each hierarchical "level" competed with superiors for autonomy and control, with peers for territory, and with subordinates for supplies and support.

The ultimate result was a political landscape in which control over resources was constantly shifting, and where the physical boundaries within and between polities were porous and flexible. One measure of these boundaries is the overlapping jurisdiction of territories by competing polities. As indicated in the previous chapter, the control for villages could be claimed by rival supra-village organizers; at the state level, the same territory could be crossed over or even claimed by rival states

(Frykenberg 1979a). Gordon offers that the concept of polity "boundaries" is not very useful even at a relatively late historical period: in the 1720's, "the rights of the Nizam and the Marathas not only interpenetrated, but they often collected revenue from the same pargana or village" (Gordon 1993:119).

## The early modern period

The intervention of European powers in the subcontinent consisted of a number of feints and starts beginning in the 16th century when the Portuguese first interacted with the western coast. Several European powers, including the Dutch, the French and the British, entered into the alliance-building activities of local rulers, providing resources and expertise to their Indian allies and dividing the spoils when their military activities were successful. The changing nature of warfare between the indigenous polities throughout the 17th century was marked by escalating cost (particularly for heavy artillery, used to besiege fortresses), so that the aggressor with the most credit had the greatest chance of success (Gordon 1993). The expanding, quasi-global resources of the British enabled them to make the most of this situation, so that by the early 1800's they held control of substantial portions of the Indian subcontinent. In Vidarbha, the area of Berar was under the control of the

Nizam of Hyderabad when it was ceded to the British in 1853; it was subsequently joined with Nagpur to form a southern portion of the Central Provinces (Karve 1968).

The governance of this large territory and the extraction of resources followed the more successful of the pre-existing models; in many areas, this consisted of the use of a district collector, who traveled an area with a small staff to regulate taxes, try cases and act as the representative of central government. This strategy had been used with success by the Marathas, as a replacement for the previous tribute-extraction methods which required chronic punitive raids on recalcitrant local leaders (Gordon 1993).

In the modern period, the most significant alteration to this landscape has been the appearance of towns and cities, which have dramatically altered the relationships between agriculturalists and non-agriculturalists. Rather than remaining in villages in a symbiotic relationship with farmers, specialized craftsmen such as barbers, ironmongers and carpenters have migrated to larger population centers; villagers make use of improved transportation facilities to conduct the majority of their business in towns (Karve 1968; also Khan 1990). In addition, census data from the twentieth century shows that there is a very low proportion of Brahmins and other high-caste individuals in the villages; in summary, "...the nature of the village is changing rapidly from a multifunctional, multicaste

community to a rather one sided specialized community of farmers..." (Karve 1968:144).

### The location of the study area within central India

The choice of a locational epithet to characterize the study area is made difficult by the many different appelations which have been given this portion of central India.[15] For the purposes of this presentation, the term "Vidarbha" has been selected, both for its very old historical identification and because it comprises a relatively limited geographical expanse. The use of the term Vidarbha to identify a janapada, a cohesive ethnic and political territorial unit, is documented in early Vedic texts (e.g. the Aitareya and Jaiminiya Brahmanas), while the first definite indication of the location of the

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[15]Alternative choices include Maharashtra, which is the modern state in which the study area is located; use of the term Maharashtra would however conflate the large modern state with the much smaller geographical entity identified by the ancient use of the term (Raychuri 1982[1960]). The modern state of Maharashtra is quite large, extending to the Western coast, and is more accurately characterized as a modern language-based geopolitical entity than as a cohesive historical unit (see Dikshit 1986).

Likewise, the "Deccan" is a label with considerable elasticity, being identified sometimes with the underlying geological formation known as the Deccan basalt province (limited to the western subcontinent), and sometimes characterized as the entire middle portion of central India between the Krisna and Godavari rivers and between the Bay of Bengal and the Arabian sea (e.g. Raychuri 1982[1960]).

Vidarbha janapada is given by the Mahabharata which refers to a town named Kundina--often identified with modern Kaundinyapura, the archaeological site which is the focal-point of this project--as its central town (Raychuri 1982[1960]).[16] In modern terms, Vidarbha consists of nine districts in eastern Maharashtra state, between 18°41′ and 21°46′ North latitude, and between 75°57′ and 80°00′ East longitude (see figure 4.3, figure 4.4; Mukherjee 1967).[17]

## Geology and climate of central India

The geographic conditions and land-based resources of central India have permitted the flourishing of different scales and intensity of human occupation. Shifts in the scale of political or economic activity cannot, however, be attributed simply to climatic or environmental changes; it

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[16]Though there are no clear references to any city south of the Vindhyan mountain range in the Vedic texts, "the cognomen Kaundinya applied to Vidarbhi in the Brihadarayaka Upanishad may point to the existence of the city of Kundina in Vidarbha or Berar in the age of the Upanishad. The city was certainly known in the Mahabharata and is possibly represented by the modern Kaundinyapura on the banks of the Wardha in the Chandur taluk [now Tivsa taluk] of Amraoti" (Raychuri 1982[1960]:54).

[17]Other descriptions of Vidarbha are similar, though the longitude and latitude may vary. For example, Mohanty and Joshi (1996:158) identify Vidarbha as the area between 19°26′ and 21°47′ North and 76°56′ and 79°23′ East. A slightly larger area is indicated by Ranade (1990:2), who describes Vidarbha as the area between 17°51′ and 21°46′ North and 75°57′ and 80°59′ East.

Figure 4.3. Location of Vidarbha (shaded) with reference to the modern state of Maharashtra and the national borders of India

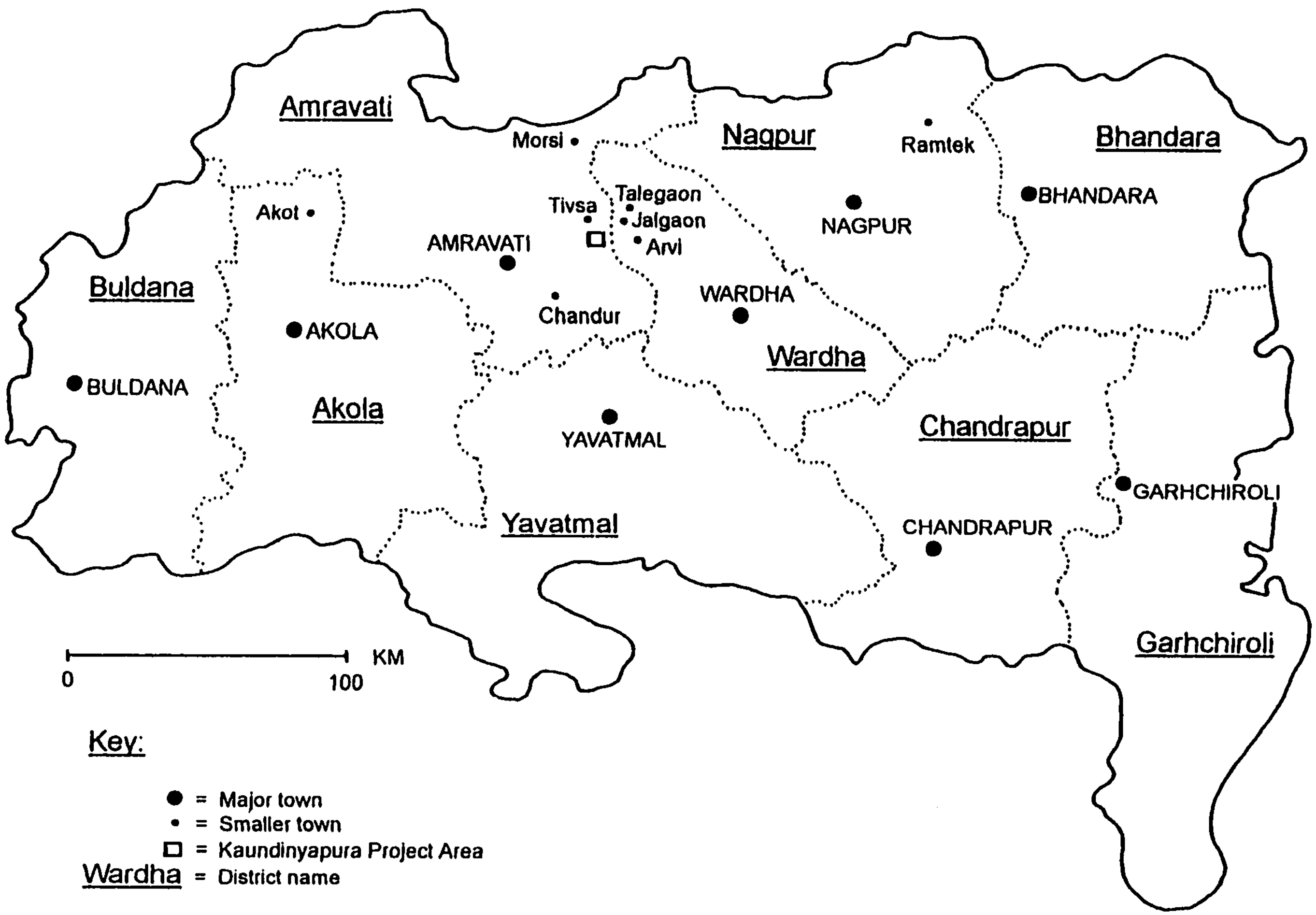


Figure 4.4. The Vidarbha region, showing modern district boundaries and towns mentioned in the text (adapted from T.T. Maps and Publications 1992)

appears that different political formations made use of essentially the same landscape.

The most distinctive geological element in the area of west-central India is the very extensive series of basaltic flows, approximately 30 million years in age, known as the Deccan basalt province (figure 4.5).[18] The decomposition of this rock has produced a deep black soil which is concentrated in valleys and foothill plains, popularly known as "black cotton soil" for its exceptional suitability for cotton production (Dikshit, 1986). In the semi-dry plateau, this "black cotton" soil is clayey and rich in iron and high in moisture-retentive properties; when redeposited along the river valleys, these soils become deeper and heavier (Arunachalam 1985:16). To the east of the Deccan basalt province is a region of granite gneisses, which results in a very different geological profile, containing iron ore, sandstone, and a wide variety of mineral resources such as coal.

The climate of central India is dominated by summer monsoon rains which provide the majority of the annual rainfall (Dikshit 1986). Most of the agricultural activities in central India are dependent upon this annual rain cycle, with relatively little irrigation agriculture

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[18]Also known as the "Deccan trap"; the word "trap", originally a Scandinavian designation, is being discarded in favor of the more neutral "basalt province" (H.M. Ramchandra, pers. comm.).

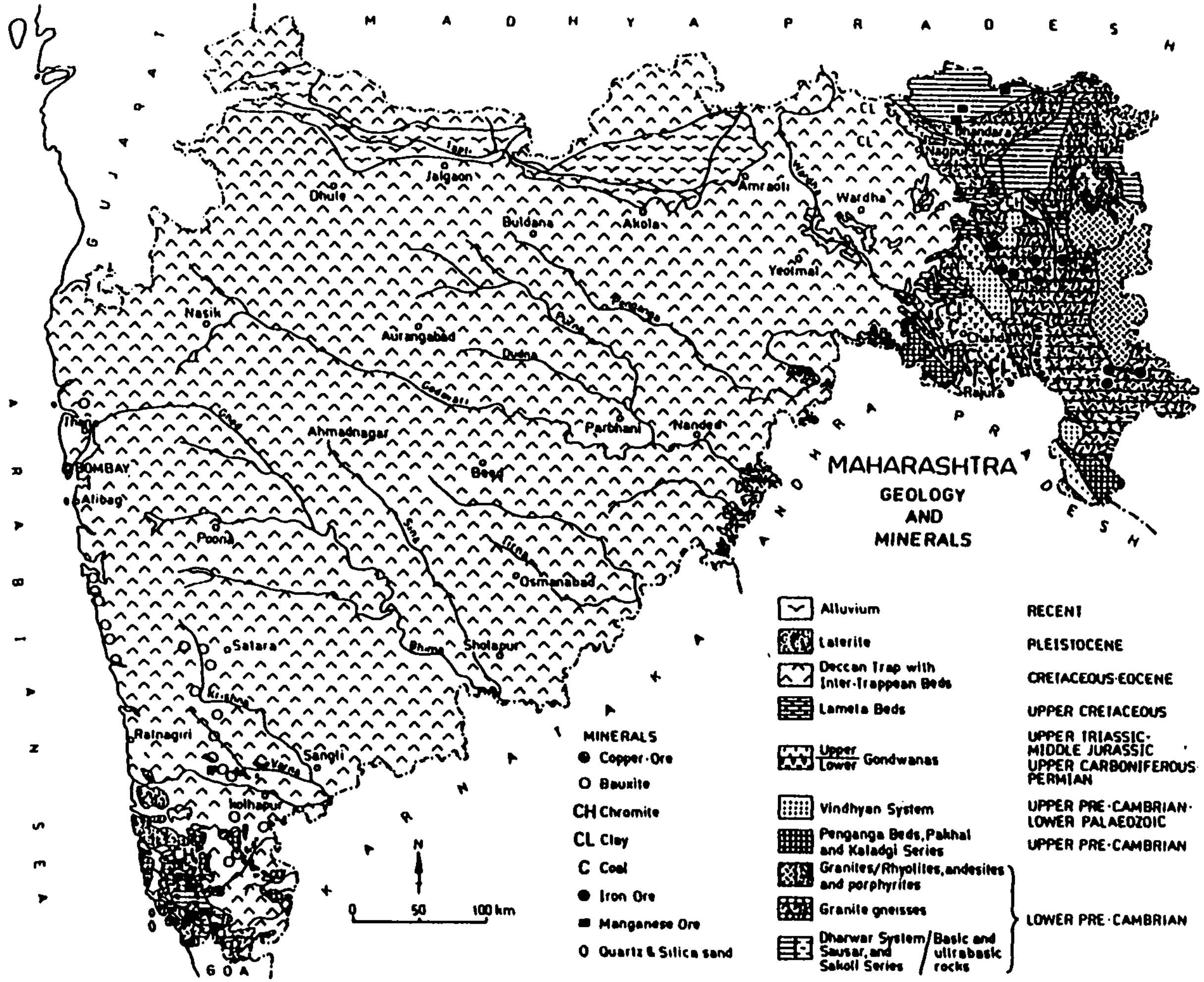


Figure 4.5. Geological map of Maharashtra, indicating the dominant geology of basalt and basalt-derived soil in western Maharashtra (Dikshit, 1986:18). The study area is located on the Wardha river between the towns of Amravati and Wardha

practiced. The area is also noted for the intense heat which precedes the monsoon, where temperatures in the plains around Nagpur reaching 40° C and higher in April, May and June. Much of Vidarbha is within the watershed of the Godavari river, which thereafter empties into the Bay of Bengal on the eastern seaboard of the subcontinent.

The predominantly dry climate supports a wide variety of vegetation including both agricultural crops and wild plants. The present configuration of forests in central India is only a fraction of its past extent, with the population increase of the past several centuries, as well as the intensive exploitation of the forests under British control, credited for the diminution of forest land (Dikshit 1986). At present, the Vidarbha region of Maharashtra currently contains approximately 50% of the state's forests (Dikshit 1986). These forested regions produce a large number of supplemental food and fodder, as well as being a principal source of fuel and medicinal plants. Forests in the area up to 100 kilometers' radius from Kaundinyapura are characterized as "tropical dry deciduous forests" though this classification is a blanket term utilized to identify areas where evergreen and moist deciduous forests are absent (Dikshit 1986). Agricultural crops include a wide suite of rabi (winter) and kharif (summer) crops, including millets, pulses, and wheat.
In modern times, the use of irrigation has enabled the production of crops such as sugarcane and wheat as well as

grapes, bananas and oranges (Dikshit 1986).

## Conclusion

The earliest Indian documents on political economy present a view of the subcontinent being well-regulated by "empires" and long-lived polities. Some polities, such as the Mauryas of the third century B.C. and the Guptas of the 4th century A.D., clearly exercised some effect upon subordinates and territorial neighbors. However, examination of the ruling strategies of the various smaller dynasties of the pre-modern period starting with the Satavahanas suggest that the presence of many competing local and regional polities thwarted the establishment of strong central control. The costs of outright domination were high, so that successful centralizing polities utilized a variety of low-cost strategies to maintain control over subordinate territories. These strategies included the use of local kings in a supportive subordinate capacity and the division of the ruling family into geographically-based branches. The control exercised by any ascendant center was usually short-lived, as shown by the fortification of sites and the inscriptions which bear witness to many local rulers.

The much greater documentation available for the late medieval and early modern period provides more detail about the logistical and material difficulties of the maintenance

of large-scale polities. Even in this relatively late period, the superior weaponry which could reinforce central dictates did not always provide political agents with firm control. The literature of the Mughal and later eras reveal polities which have difficulties maintaining control of their subject lands and of their territorial extent. Again and again, the centralized bureaucracies maintained their control through continued negotiation and alliance, and by extending threats and rewards to their peers and to their subject territories. It was the successful management of smaller-scale entities which made possible any consolidation of rule and the provision of tribute and taxation to the center.

# CHAPTER V

## REGIONAL AND LOCAL TRADE IN THE INDIAN SUBCONTINENT IN THE EARLY HISTORIC PERIOD (THIRD CENTURY B.C. TO FOURTH CENTURY A.D.)

The first two chapters of this work discussed the role of goods in the identification of social space and the establishment of individual and group identity, and how the use of goods to frame and maintain social constructs helps to explain the continuance of trade in the absence of political unification. In the third chapter, the history of India was examined to suggest that the Early Historic period, starting in the third century B.C., offers an appropriate test case for the examination of trade contacts, since there was little long-term political interaction in the subcontinent. This chapter will discuss the archaeological evidence which suggests that long-term trade interactions did take place in the early centuries B.C. and A.D., and that this interaction was manifested in a variety of trade items common throughout Indian sites.

The widespread presence of some items of display, such as ornaments and pottery, indicates the presence of common traditions which transcended political divisions. The first part of this chapter will examine the range of trade goods which are found in excavated sites of the Early

Historic period indicating the transfer of "style" as well as the movement of physical objects (figure 5.1). The second part of the chapter will focus on trade activities in central India during this time period, and the evidence from a variety of previous archaeological projects in this area. This chapter will serve as the archaeological background for the discussion of the specific research project which was designed to examine the role of a local trading town in a trading network, and the way in which this network made goods accessible to all members of Early Historic society.

From the second century B.C., there is documentary and archaeological evidence for thriving exchange activity around the Indian Ocean littoral which brought into contact peoples from the the Roman Mediterranean, northeast Africa, Arabia, the Indian subcontinent, and southeast Asia. A group of specialized traders is identified as responsible for the transport and exchange of goods across the oceans, and it is likely that specialized merchants continued to care for the shipments of exotica once they reached port (Casson 1989; Liu 1988). However, this oceanic long-distance trade appears to have been almost exclusively devoted to high-value goods, such as gold, spices, resins, wine and fine cloth. These commodities, though they may have been locally-abundant at their natural or cultural sources, were transformed into preciosities by the factors of distance and difficulty entailed in their overseas

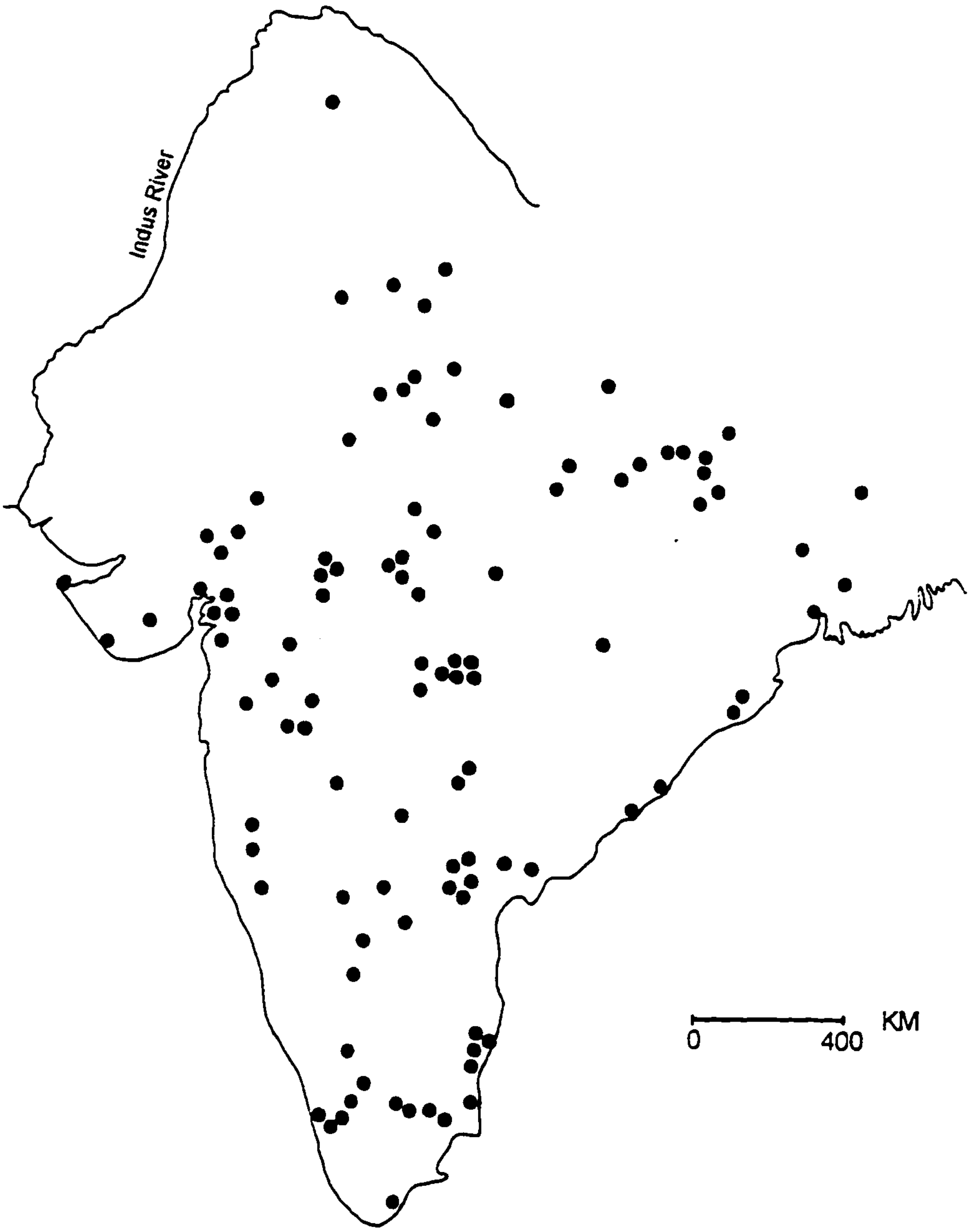


Figure 5.1. Early Historic sites in the subcontinent for which substantial information about cultural assemblages is known, as compiled from site reports and Indian Archaeology, A Review

transfer. As such, they were generally destined only for elite groups.

Port sites and trading centers were the places at which traders from different cultures met, and the places at which goods were transformed from abundance to preciosity. However, from the point of view of those port sites, the goods destined for overseas trade constituted only a small portion of the traffic in goods on land. Once on land, the movement of exotic goods inland to consumers took place along the same physical routes which were used to transport ordinary goods for local use, such as agricultural produce, household implements, and domestic animals. These inland trade routes were used not only by traders moving their wares, but also by many different types of people who traveled for religious pilgrimages, military activities, and family relationships. The large-scale movement of people and goods indicates that hinterland-port relations were part of a widespread, thoroughly developed series of trade relations which thrived because of local needs.

While many of the goods which were transported in these trade networks were perishable, archaeological evidence indicates that transfer of durable goods such as ornaments, ceramics, coins, and other items which encompassed both a utilitarian and a display value. The ubiquity of these goods in Early Historic sites indicates that there was widespread exchange of both stylistic

information and actual goods.

### Items of regional and local exchange in the subcontinent

The pyramidal diagram (figure 5.2) indicates the three groups of trade goods found in Indian sites of the Early Historic period. The goods in the uppermost section of the "pyramid" are the most rare, and represent goods arriving in the subcontinent as the result of Indian Ocean and other long-distance trade activities. The goods in the middle category are those which are found in almost all sites of the Early Historic period in India. The final category represents the types of goods which probably comprised the largest proportion of inland trade. These goods were traded between sites for domestic use, but also became part of the long-distance trade network because items such as forest products (skins) and agricultural products (wool, cotton, spices) were desired goods for overseas trade as well (Casson 1989). However, these goods are perishable, so that only indirect evidence of the production and consumption of these goods is usually found in archaeological sites. Thus, the middle category of goods is the most useful for documenting the presence of regional and local trade networks in the subcontinent. Excavation reports from Early Historic sites throughout the subcontinent show a consistent catalog of items such as

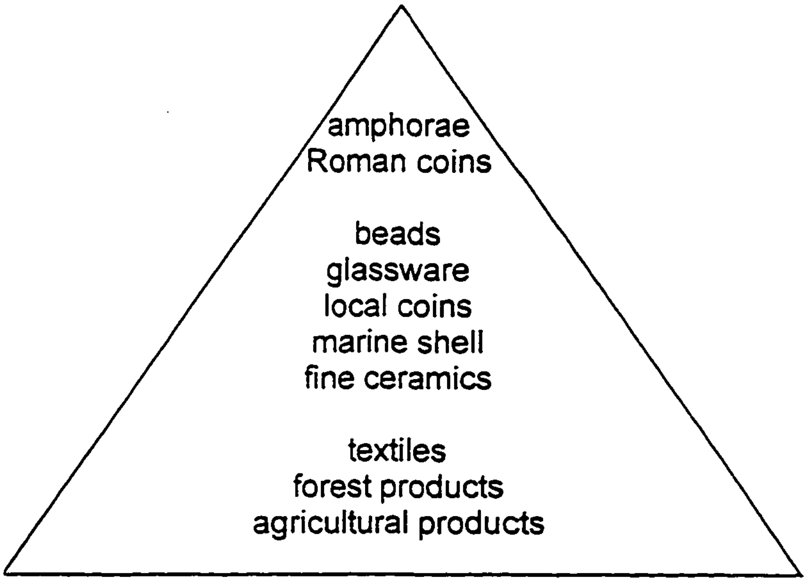


Figure 5.2. Trade goods in the Indian subcontinent during the Early Historic Period

marine shells, ornaments, fine ceramics and coins. The widespread appearance of the same types of artifacts is due to two factors: the transfer of actual items, and the transmission of ideas and styles.

One particularly striking proof of the exchange of material items throughout the subcontinent in this period is found in the use of marine shells. The large gastropod *Turbinella pyrum* has a natural distribution in the southeastern and northwestern coasts of the subcontinent (Nagappan Nayar and Mahadevan 1974). However, it is found at many inland sites of the Early Historic period, in both whole and fragmentary form (figure 5.3). Whole shells were hollowed out for use as trumpets, but the shell was primarily used for making bangles and ornaments. The discovery of shell fragments far in the interior indicates that whole shells were transported, rather than the brittle bangles. Because the shell is quite distinctive, it is easy to recognize fragmentary portions in the archaeological record. As the shells of the minimum appropriate size for making bangles represents at least 150 grams, we can begin to see that regional exchange was not limited to very small items.

The recovery of marine shells in the interior of the subcontinent indicates the transfer of both raw materials and technology and expertise, since the manufacture of bangles from the shell requires skill in breaking the interior of the shell, and in sawing of the upper rounded

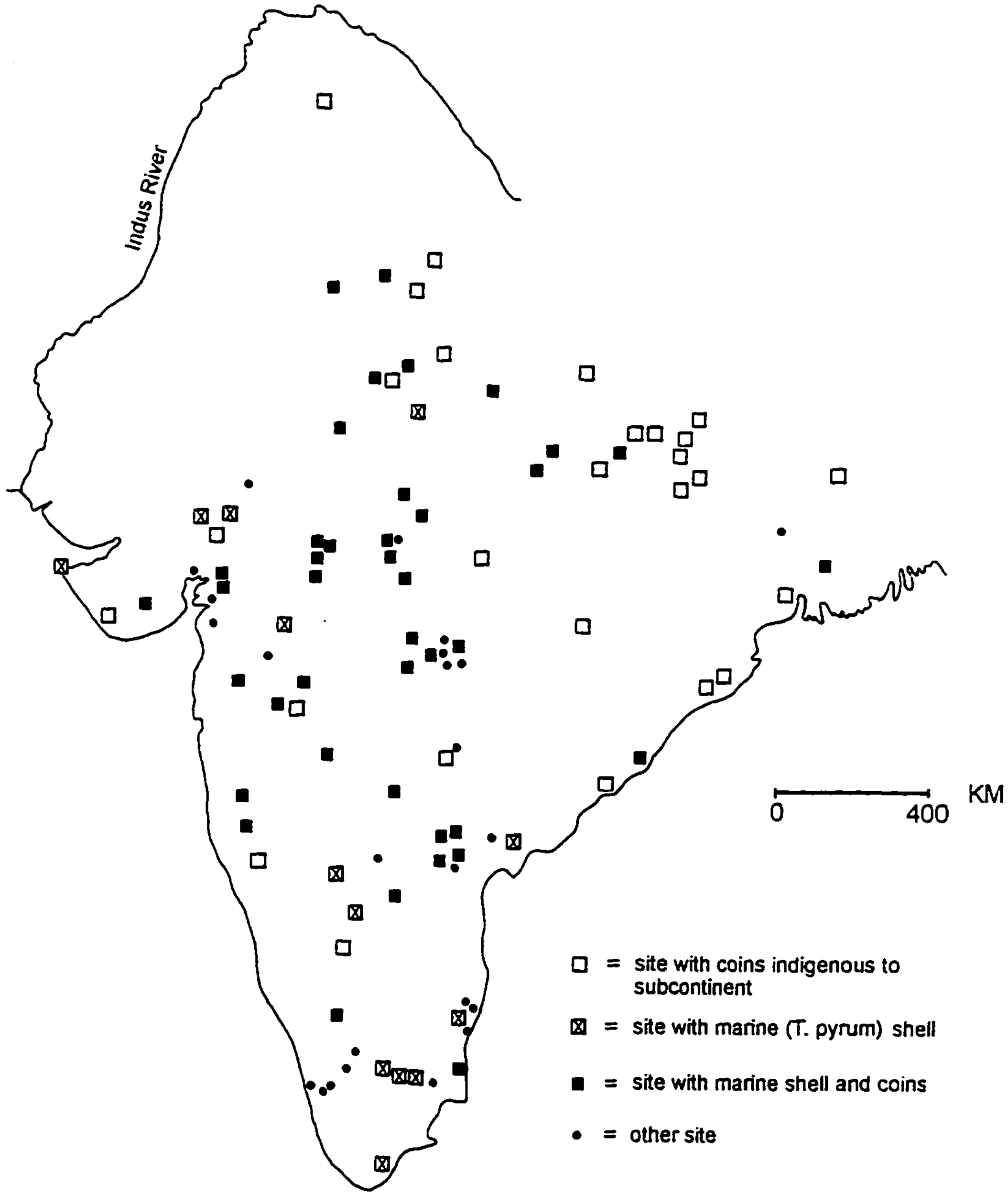


Figure 5.3. Sites in which *T. pyrum* and coins are reported for the Early Historic levels

portion of the shell into bangles (Kenoyer 1983). The use of this shell for the making of bangles and other ornaments is a long-lived tradition in the Indian subcontinent, with the archaeological record revealing use beginning in the Bronze Age. Shell bangles and waste fragments of *Turbinella pyrum* are found in sites of the Harappan period beginning around the end of the third millennium B.C. on the western subcontinent at coastal sites such as Nageshwar (Sonawane 1992), as well as at Mohenjodaro (Kenoyer 1984) and Harappa (Kenoyer 1983). The presence of *T. pyrum* in the inland portions of the subcontinent indicates that the exchange of this marine item was carried out over large areas beginning in the Chalcolithic period. At Tuljapur Garhi, a site only 65 kilometers northwest of Kaundinya-pura, levels of the Chalcolithic period (late 2nd to first mill. B.C.) contained bangles made of *T. pyrum* (Thomas 1992b).

Evidence from the Early Historic period, beginning around the 3rd century B.C., suggests that in addition to being a suitable material for ornaments, this particular shell began to take on a symbolic value as well. When made into trumpets, they become the instruments for sounding battle calls, as noted in the Tamil poem the <u>Maduraikanchi</u>, written in the late 1st century A.D. (Chelliah 1985). This same poem, which describes town life in the southern town of Madurai under the illustrious king Nedunjelyan II, also speaks of divers fishing for chanks, of the act of cutting

and filing bangles from shells, and the sale of bangles in the streets of the town.[1] The use of the shell as a symbol grew after the Early Historic period; it is often a decorative motif in religious art, and is one of the identifying iconographic attributes of the Hindu deity Vishnu. Thus, the historical record suggests that this shell and the items made from this shell were widely recognized, and that this symbolic value was in part responsible for its popularity in the subcontinent.

During this time period, there is also ample evidence for bangles made of other materials, including terracotta, iron and copper. The raw materials for these bangles were more easily available than marine shell. The very different appearance of these other types of bangles however probably did not mean an attempt to duplicate shell bangles in other materials, but rather that there were different categories of ornaments which may have projected the owners' social standing and wealth. Bangles comprised a category of goods which served the general population as goods of social significance, widely used by all sectors of the population and one of many material goods indicative of

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[1]Specifically, the poet tells the king, "Thou are beloved by those of Korkai's town/Containing hamlets in which divers live/Who dive for fishing chanks and pearls mature" (lines 127-129); "In the neithal tract are found fine sparkling pearls/Which the shining sea doth yield, bright bangles cut/And shaped straight with the file, and other wares/That merchants sell (lines 328-330)(Chelliah, 1985).

participation in a common culture.

The significance of ornamentation is seen in the depictions of individuals in the sculpture at sites such as Bharhut, Sanchi and Amaravati, as well as on terracottas and other portable art objects (figure 5.4). But the possession of certain kinds of bangles might signify the wearer's particular status within the community. Being made of a shell which was acquiring symbolic value, the bangles made from *Turbinella pyrum* activated and symbolized regional ties and the contacts between different areas of the subcontinent. The widespread distribution of marine products, up to 500 kilometers inland, indicates the presence of an exchange process which supplied the raw materials and information about style resulting in what we now perceive archaeologically as a common material culture.

Other types of ornaments, such as beads and ear-spools, were also widespread in the Early Historic period. The existence of prevailing bead styles indicates that both actual beads and information about fashion circulated in the inland trade networks. Beads made from rare or distant raw materials, such as lapis lazuli, are found at inland archaeological sites (e.g., Nevasa Sankalia *et al.* 1960). At the same time, a consistent style of beads is noted from materials, such as agate and freshwater shell, which are widely available. The presence of unfinished beads at many Early Historic sites suggests that beads were locally made, perhaps because the grinding and polishing of stone beads

Figure 5.4. Ornaments as seen on sculpture and portable items of the Early Historic period. Left: detail of men wearing bangles, from Gandhara Buddha figure, Loriyan Tangai, 2nd-3rd c. A.D. Right: heavily-ornamented female figurine, Tamluk, Bengal, 2nd c. B.C. Both illustrations adapted from photographs in Allchin 1995)

was a labor-intensive but not particularly skilled task, and one which could be undertaken opportunistically by households to generate a surplus of items which could then be utilized in a variety of religious, social or market transactions.

Evidence also exists for other types of display and utilitarian goods such as common pottery types. Many sites of the Early Historic period have evidence for well-made ceramics, often referred to as Red Polished Wares and Rouletted Wares. Although there has not been any systematic classification of archaeologically-recovered materials, these wares do stand out from the remaining ceramic corpus by their fineness of paste and surface finish, indicating a standard of production with a greater labor investment than the remainder of the ceramic corpus.

Another indicator of flourishing trade in the subcontinent is found in the use of coins. As with the appearance of ornaments and ceramics, the widespread distribution of coins indicates several levels of exchange activity, as exhibited in the trade of physical coins as well as the understanding of concept of coinage as a standard of value and a medium of exchange. In the subcontinent, the use of coinage dates to the mid-first millennium B.C., when punch-marked coins began to be utilized in northern India. These earliest coins, starting from the 5th century B.C., are metal strips or flanges onto which symbols have been cold-hammered. Later, these

"punch-marked" coins with their corpus of common symbols were replaced by die-struck coins.

The distribution of coins is varied: some coin series, thought to be "local" issues, are found in limited areas. Other coin series, such as the Indo-Sassanian Kshatrapa coins, are found far from the homelands of the rulers who initially issued them (Shastri 1992b). Although the role of precious-metal coinage in the economy of the time is debated, it is argued that this particular silver coin type is widespread due to political agents, even outside Kshatrapa dominions, who reproduced these coins because of their acceptance in trade (Jha 1991).

The practical use of coinage is also demonstrated by base-metal and copper issues which circulated in the Early Historic period. The presence of a large number of such coins throughout the subcontinent, when each type often had a restricted distribution, suggests the use of coinage in the fully modern sense, as a standard of value and as a medium of exchange (B. Lahiri 1991; D. Mukherjee 1991). Coinage, with its depiction of portraits, script and symbols had the possibility of conveying multiple meanings, whether or not it was also utilized as a general-purpose money. Examples of the use of the coin-form as a symbolic token includes the duplication of metal coins in clay for use as ornaments, frequently known as terracotta bullae (for example, at Ujjain; see Gupta 1991; further examples are noted in Ray 1985). The variety of coin types and

their distributions is a strong indicator of the levels of constant contact between regions, and the transfer of both material objects and information. In the distribution of coins, we have evidence both for the recognition of common forms and symbols, and of the presence of a market system in which coins facilitated exchange.

## The organization of production

A discussion of trade necessarily entails a discussion of production as well as of consumption. The items of local and regional exchange within the subcontinent were obtained from a variety of natural resource areas as well as being the product of a variety of both specialized and unskilled manufacturing techniques. The archaeological record provides evidence for specialized manufacture in items such as shell bangles and metal coins, where the expertise and equipment required for the manufacture of finished products would not have been available to all persons. This manufacture however also encompassed repetitive tasks which required only a low level of skill, such as gathering of fuel, pumping of bellows, or work area cleaning and preparation. Other repetitive and low-skill tasks such as stone-polishing formed a major component in the manufacture of beads. These tasks could have been performed by unskilled assistants as work performed outside of their principal occupation, such as by farmers at times

when agricultural labor needs were low. Such tasks may also have been performed by individuals not able to undertake more strenuous labor, such as the elderly and the young.

The presence of a variety of ceramics including finely-made wares in sites of this time period indicates that ceramic manufacture may have been a specialized occupation. The determination of the organization of production from archaeological remains has been extensively discussed (e.g., Arnold and Nieves 1992; Longacre, Kvamme and Kobayashi 1988; Rice 1984; Schreiber 1992; Sinopoli 1991; Stark 1992; Stark 1985). In general, it is difficult to infer from the finished product whether a ceramic vessel was necessarily produced in a workshop or on a household level by individuals for their own use. However, the presence of different qualities of goods indicates that some vessels incorporated a higher level of care and attention in production; subsequent examinations of the archaeological record for locations of dense production waste may afterwards answer questions about the organization of production for certain ware types.

The evidence of specialized occupations in the Early Historic period is indicated by textual referents to types of occupations. The *Milindapanha*, dated to the second century B.C., lists about seventy-five occupations; another document dated to the first A.D., the *Mahavastu*, indicates nearly 100 occupations in the cities of Rajagriha and

Kapilavastu (Sharma 1991). Evidence for large-scale manufacturing of goods in the Early Historic period is limited, though it appears that the concept of large-scale production was recognized, as indicated by inscriptions which mention "guilds" as donors to religious institutions (Ray 1986). The guilds mentioned in the cave-inscriptions of Western India include weavers, potters, bamboo-workers, oil millers and "dealers in water machines" (Ray 1985). These groups engaged in a variety of activities, including monetary investments with profits sometimes designated to benefit monasteries or pay for the maintenance of monks. Guilds engaged directly in trade activities not only through the manufacturing activities of their members, but also through the maintenance of protective groups (sreni-bala, or "guild armies") which accompanied traders or pilgrims (Mirashi 1981). In the far southern subcontinent, the Sangam body of literature dating to the first few centuries A.D., also makes reference to members of the warrior class who accompanied merchant caravans (Subramanian 1966).

The presence of what appears to be organized corporate bodies identified as makers of particular goods or holding market specialties indicates that certain craft activities were carried out or managed by groups which organized surplus production. The presence of guilds does not necessarily imply a different type of production, since guilds may have only governed and coordinated the

production of cottage industries rather than establishing their own workshops. Items such as textiles and agricultural products, documented by the historical and archaeological record, could have been manufactured at the household level utilizing surplus family labor. The mention of guilds or other corporate groups does imply exchange, since the products of the manufacturing processes were to be produced in sufficient quantities to be traded away from production areas.

Economic interactions in the Satavahana period, as described in the Jatakas, show an "economy which was only marginally under state control and had a complex mechanism of trade, with commercial transactions at different levels governed to a great extent by the nature of the commodity handled" (Ray 1985:20). As noted in the previous chapter, political entities were not stable enough to generate the surplus revenue required to maintain trade facilities and to secure routes of travel, especially in areas of low population density. Other organizations, such as religious institutions, did fulfill some of these needs, in maintaining monasteries and other religious sites which traders utilized (Liu 1988; Ray 1986).

The organization of surplus production at a variety of levels, both household and corporate, continued in subsequent periods. Because there are few contemporary documents which discuss commercial activities for the Vakataka era, it is perhaps instructive to look elsewhere

in the subcontinent for contemporary developments in commerce and manufacturing. For example, it has been suggested that since contemporary records show guilds elsewhere in India during this period, they probably existed in the Vakataka polity as well (Altekar, 1982[1960]a). While the supposition of actual guilds in the Vakataka areas based on the economic structure of contemporary polities is inadvisable, it is probably safe to say that even if there were no actual guilds in the Vakataka area, the contact between peninsular groups meant that the concept of guilds was a common one. The level of expertise required for manufacturing the artifacts of this period, including fineware pottery, iron, stone beads and other crafts probably also indicates that there was a concept of specialized manufacture as well, in that some individuals made goods for exchange with others.

To understand the relationship between political entities and manufacturing activities, it is instructive to examine the development of market centers in areas which appear to have had a greater population density than central India. In the south, documents regarding the city of Kanchipuram indicated that in the sixth century A.D., it was a center of weaving located in a prime cotton-producing area. As the Pallava capital, it was one of only two population centers designated as a "managaram", or large nuclear market (Hall 1980b). Both of these population centers were also administrative centers. Population

centers in the hinterland were less-affected by political entities, and were probably influenced by mercantile interests rather than central state control and protection (Hall 1980b). The development of the managarams in southern India was exceptional, as they required a certain level of population and organization to maintain the concentration of political and mercantile activities at central places. In central India, where population density was lower with fewer concentrations of population, there is little evidence that any sites served as large, specialized regional markets.

## Caste constructs and the organization of production

The institution of caste as a social and ritual divisor is well-documented for modern India and forms a body of study in its own right. Many excellent studies have considered the implications of caste for modern development, and as an organizing principle of daily life. However, it is incorrect to presume caste structure as an explanation for the construct of social and economic interactions for the Early Historic period. The references to caste organization in the earliest literate period are sparse, and generally make reference only to the role played by the highest-ranking caste groups (principally Brahmins). The nature of caste in the early historic period is unclear, with the evolution of guilds into

"jatis" (caste-constructs) perceptible only in the mid-first millennium A.D. (see Thapar 1992:30). Early inscriptions of the Vakatakas also indicate that "the four-fold brahmanical social stratification was still largely functional and a matter of choice (varna) and had not wholly become a system based on the accident of birth (jati)," in that even high-ranking persons may have designated themselves as any one of the three highest ranks of the four-fold groups (Ramesh 1992:28). Speaking specifically of Maharashtra, Karve notes that few castes were noted in the earliest Indian writings, and that it was not until a few centuries after the Christian era that castes, "as the endogamous groups known today, began to be mentioned in literature" (Karve 1968:84-85). In inscriptions of the early medieval period (7-13th centuries A.D.) in the western Deccan, there is little mention of groups according to their "caste" status; moreover, not all of the four traditional varnas are mentioned, leading Yarlagadda to speculate that there was not a spread of the khsatrya and vaisya varnas, but a proliferation of brahmana and sudra varnas (Yarlagadda 1993).

Other authors also agree that even in the Vakataka period, "the caste system existed in Hindu society, but it was not yet very rigid" (Altekar 1982[1960]a). In general, the presence of caste-names in inscriptions is an insufficient indication of the role of those groups, and reliance on the caste-construct as an explanatory mechanism may

deter more productive lines of inquiry about ancient economic activities (Parasher-Sen 1993).

The identifying characteristics of a *jati*, or sub-caste, are as follows: "occupation of a limited contiguous territory, hereditary work, rank and endogamy" (Karve 1968:104). However, each of these aspects can be altered, as documented by twentieth-century studies of different *jatis*. Individuals and families may migrate from one area to another, and the rank of entire caste groups can be manipulated to "improve" the group's social standing; castes can alter their social status by emulation of higher-caste attributes such as the adoption of vegetarianism (Miller 1985; Mukherjee 1994).

Mukherjee documents this transition by the Rajbanshis in the area of Rungpore, a Hindu group which sought to claim kshatrya caste status and carried out various group activities to force the general recognition of the new, higher status (Mukherjee 1994). In 1920 the Rungpore Kshatrya Samiti, an activist group, was convened to instruct people in Hindu ritual and to popularize the rituals, customs and manners of upper-caste Hindus (including the adoption of the sacred-thread ceremony and the shortening of the mourning period). Rajbanshis who persisted in practicing their original customs (e.g., eating meat, drinking alcohol and permitting a high degree of female liberty) were fined or ostracized. The Rajbanshis gradually encompassed three groups: those who

retained the sacred thread, those who had it but discarded it, and those who never had it; these divisions also corresponded to socio-economic categories (Mukherjee 1994).

More importantly for this study, the economic role played by different castes and *jatis* is also a subject to change. Even if one insists upon the presence of caste-organization similar to modern constructs in the Early Historic period, observations of modern caste organizations suggest that occupations can shift under new political or technological circumstances. Hereditary divisions of labor are subject to economic changes when new demands for labor encourage or compel individuals' change of occupation, as noted in the census data from twentieth-century Maharashtra where only 25-50% of some *jatis* were doing their "hereditary" work in 1961 as compared with 1911 (Karve 1968). In some cases, the hereditary work was adopted by other groups; in other cases, new types of work superseded caste lines. Karve observes that "In the town the profession of tailoring seems to be followed by people belonging to almost all castes. It seems as if it is a new kind of profession which does not need too great a capital or too great a skill and which does not involve the losing of status for people of higher castes like Brahmins or Marathas" (Karve 1968:112).

A shortage of labor devoted to certain tasks may also initiate new activity by groups not traditionally associated with a certain type of production. The census

of Berar for 1881 indicated that the demand for iron-workers expanded the number of people performing this type of work: "Although the majority [of iron-workers] are Lohars, the members of many castes work in iron...it will be noted that the competition, even in scanty numbers, of such castes as the Sutars, Wanis, Rajputs, Kunbis, etc. is a mark that, to a certain small extent, occupation is ceasing to be hereditary in this, as in various other previously mentioned castes" (Kitts 1882:197).

Changes in occupational groups is also evident in the medieval period, when the new ruling classes of western and central Asia introduced new technologies (and thus new professions which utilized them) in the 13th and 14th centuries A.D. such as the spinning wheel, paper-manufacture, and the iron horse-shoe, among others (Habib 1995[1987]). Habib goes on to observe that while caste-affiliation was a background to economic transactions and stabilized the division of labor in petty production, "it is questionable if these functions were crucial enough for us to propound that caste defined the form of the labour process in medieval India (c. 1200-1750)" (Habib 1995[1987]:177). The elements of increased economic strength which can give caste groups negotiating power was also seen in the medieval period. At Vijayanagara, the economic importance of weavers increased their political visibility so that they were able to force the recension of a tax increase in 1513 (Ramaswamy 1985). It also appears

that barbers, who held a low social ranking, increased in status in this period (Ramaswamy 1985).

These examples from the medieval period, when more documents concerning economic activities are present, illustrate that caste constructs are flexible, and can shift according to political, technological or social changes. If this is true for the medieval period, then the "caste" constructs of the Early Historic period--a time widely felt to have had only limited forms of social segregation, the character of which is almost entirely unknown apart from the religious activities of the uppermost echelons--are very unlikely to have affected economic processes.

## The organization of distribution

It is proposed that the unstable political conditions of the Early Historic period would not have favored the establishment of exclusive long-term trading relations between sites. Rather, it appears that the desire for certain goods valued as status markers would favor the construction and maintenance of opportunistic trading alliances. As with the organization of production, the means of distribution of goods was variable depending on demand, local environmental variables including the availability of surplus labor, and population density.

It is proposed that a variety of different merchant

strategies were utilized in the trade of items, and that these strategies coincided with the levels and organization of production of different items in different areas. As indicated above, merchant groups such as guilds were capable of assembling and maintaining their own mercenary forces for the protection of caravans. However, a variety of other trading strategies were probably utilized; this list identifies the types of merchants and exchange mechanisms which served to move goods:

Fixed-place merchant: The advantages of this type of marketing includes the accumulation of capital through the availability of a storage space (cf. Singh 1965; Tamaskar 1985). A disadvantage is that the burden of transport is borne by the customer; for this to occur, the merchant must have sufficient advantages (e.g., greater selection, lower prices) or be advantageously placed with reference to other facilities, such as religious sites, which draw travelers.

Periodic markets: These markets permit exchange at a number of fixed points in the landscape on a regular schedule (Skinner 1964). Periodic markets incorporate or foster the development of fixed-place shops in addition to itinerant sellers, and periodic markets may evolve in a cyclical pattern as the instability of the beginning stages with a large number of itinerant merchants settles into a more permanent phenomenon with increasing numbers of wholesalers and other fixed-place shops along with a stable number of consumers (Tamaskar 1985; Singh 1965). However,

periodic markets are especially reliant on peace and stability in a region, since both consumers and producers are moving continuously in the landscape (Tamaskar 1985).

Itinerant specialist-manufacturer: Certain types of goods require expertise in manufacture. Generally, only population centers of a certain size or special-purpose centers such as religious sites can support full-time specialists, so that it is likely that some kinds of occupational specialists would move from place to place on a regular basis. In the Indian subcontinent, iron and shell objects probably constituted items which were in regular, but perhaps low-intensity, demand. Iron ore is abundant in India and is easily obtained from surface deposits (Tripathy and Tripathy 1994). However, the manufacture of iron requires special expertise, usually entailing a period of apprenticeship. In addition, the mystique of iron-working has in many cultures rendered it a realm encompassing numerous social strictures, another element pointing to the retention of this specialist knowledge by individuals. In areas of low population density, manufacturers and repairers of implements probably circulated in the landscape, both to obtain ore and to manufacture finished objects.

As noted above for marine shell, the cutting of the shell requires special expertise; while the transfer of the shell itself might be the result of down-the-line trade with shells arriving far in the interior as the result of

successive short-range exchanges, it is more likely that given the requirements of expertise, that shell merchants traveled with their raw materials.

Itinerant groups with subspecialities in trade: This group comprises those who have a primary economic activity, such as herding, which compel them to move through the landscape. Traveling in groups, an itinerant group could take advantage of mobility to pick up and trade items opportunistically or according to a seasonal round. In the Indian ethnographic record, one example concerns the Banjara people, who are primarily herders but who also trade salt on the coastal-inland portion of their annual journey (Marten 1912).

Itinerant trader: This type of trading activity requires little capital outlay and no particular manufacturing expertise. It can also be undertaken seasonally by entrepreneurs who obtain goods from manufacturers or town-based wholesalers, traveling a small regular circuit. Itinerant traders would be linked to various sources of supply, such as surplus household production as well as fixed-price merchants, and would the most flexible in terms of the location of goods and timing of sale.

## The social contexts of consumption

The three principal and interrelated components of

economic activity consist of production, distribution and consumption. The social relations of exchange take place once the goods are acquired from merchants, where gift-exchange can take place between individuals, households, religious institutions, and political agents. Consumption encompasses events of varying periodicity, depending on the commodity. Some commodities are consumed on a daily basis, including foodstuffs; other consumer cycles involve periodic or life-cycle visits to religious fairs or family gatherings. Still other types of traveling consumers include military forces which require sustenance and often rely upon local resources rather than self-transporting all required items.

Items may be obtained from a variety of sources, such as habitual itinerant merchants, local fixed-place shops, or at special-purpose destinations such as religious sites. Each type of consumption may involve a variety of procurement strategies on the part of consumers, subject to fluctuations of income and whether the commodity may be stored. Consumer choices are also guided by the type of commodity consumed. In a study of consumer behavior in a modern economy based on subsistence agriculture, S. Khan found that comestibles and repair services tended to be purchased at the local level regardless of the level of income, but that durable goods were purchased at a greater distance (Khan 1990).

The minimal unit at which these economic activities is

conducted is the household, an observation gained through both historical and ethnographic examinations of small-scale societies. For archaic Greece, M.I. Finley examines Homeric poetry to establish that wants were negotiated and fulfilled by the household acting as a unit: "The need for metal, or any similar need, was an oikos affair, not an individual matter. Its acquisition, whether by trade or by raid, was therefore a household enterprise, managed by the head. Or it could be larger in scale, involving many households acting cooperatively" (Finley 1954:415). Indeed, the formulation of the very word "economics" is a combinatory term derived from the Greek words "oikos" (household) and "nomos" (law). The examination of market economies likewise indicates that exchange is performed at the level of the household. The way in which a formal market system was introduced into colonial domains is usually discussed in terms of the household as the basic consumption unit, as in the case of Java (Alexander and Alexander 1991). The household is also viewed as the minimal unit for spatial analysis (C.A. Smith 1976a).

The aggregation of households into larger units of population often provides a more tractable means of analyzing large-scale patterns of consumption. Archaeological investigation in India, which provides presence-absence data for many sites, indicates that towns and villages were the focal-points of a very active trading environment in the Early Historic period. Any site could

participate in trade through the production of some kind of tradable surplus, such as agricultural produce, raw materials, or finished products. At the same time, these towns and villages were stopping-points along the routes of travel for pilgrims, traders, and political figures. The common forms of goods such as coins, shell objects, and ornaments recovered from sites of the Early Historic period show that trade involved the transfer of "information" and common values as well as objects.

The uniformity of material culture reflects other trends towards cultural unity in the subcontinent. The spread of Buddhism is manifested in the widespread appearance of shared iconography in the Early Historic period. Similarities of form and design in Buddhist religious establishments such as Bharhut, Sanchi and Amaravati indicate that artisans traveled the same routes as traders (figure 5.5). Starting in the second century B.C., the simultaneous appearance of the Buddha image at sites as widespread as Nagarjunakonda and Mathura (about 1500 kilometers apart) signals the presence of traveling skilled artisans (Wayman and Rosen 1990). Nor was long-distance religious travel restricted to artisans: records of donations indicate that patrons of Buddhist establishments, from kings to commoners, also traveled from their residences to shrines. Inscriptions from the cave temples of western India and from the stupas at Sanchi in the north and Amaravati in the south indicate that ordinary persons

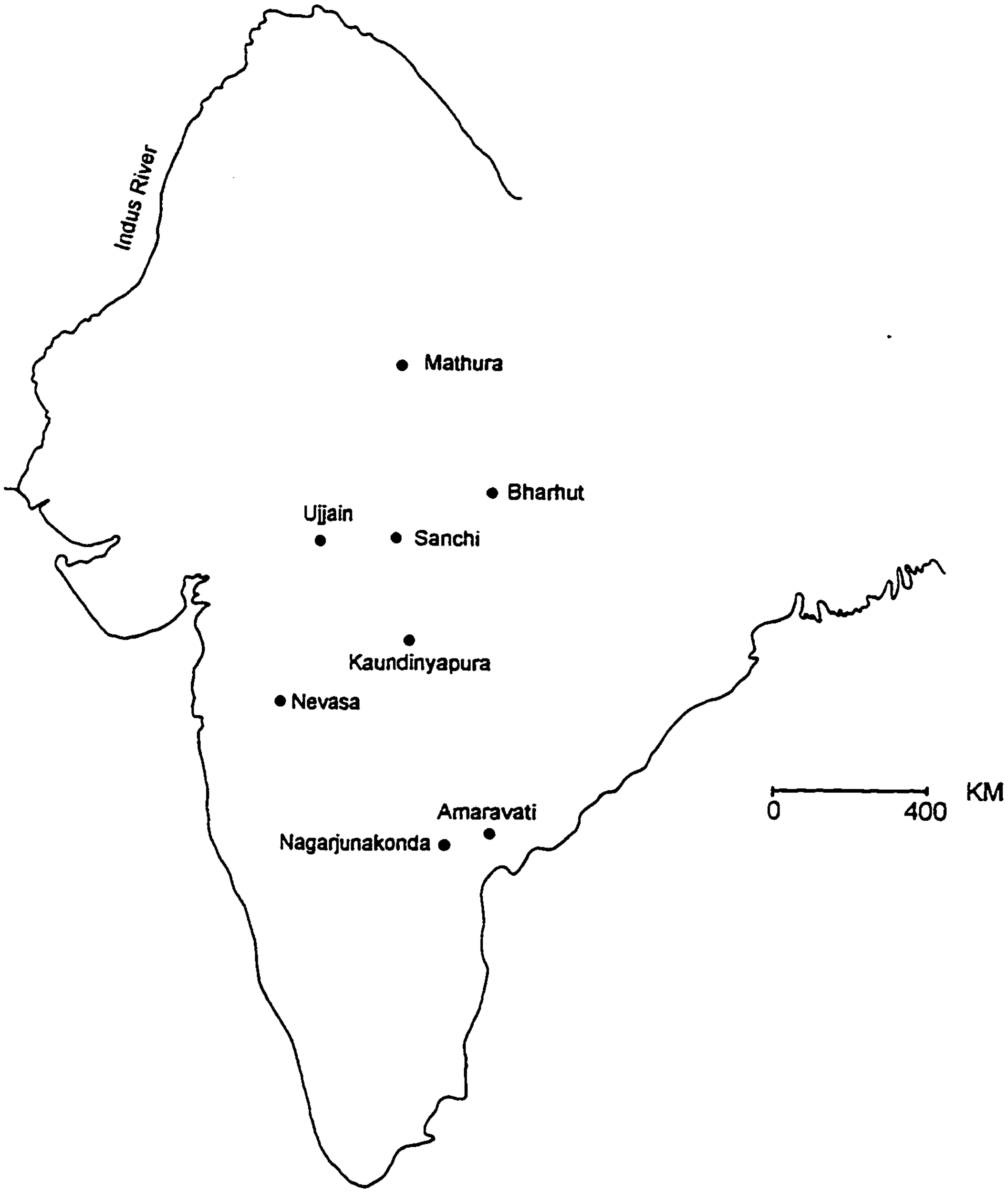


Figure 5.5. Location of Kaundinyapura and other sites mentioned in the text

made pilgrimages. In particular, the inscriptions at Sanchi, which mention the donors' homes, show that people traveled substantial distances (Bajpai 1978).

In addition to the travel along local routes indicated by the trade of goods and the fulfillment of religious duties, many other circumstances compelled and invited travel in the Early Historic period. Rulers and their armies traveled about the landscape in cycles of conquest and administration. Periodic natural disasters such as floods and droughts may also have prompted the migration of individuals and families. Specialized occupations, such as herding, favor an itinerant lifestyle.

As seen in the previous chapter, these movements of people and goods took place despite two very strong deterrents to travel: political constraints and natural constraints. The political landscape of the subcontinent can be characterized as one composed of regional dynasties, with shifting control over territory and resources. The ability of these dynasties to create surplus wealth was limited, so that there was little government-provided infrastructure of the kind acknowledged as essential for trade in the modern world such as good roads, communications networks or security (Plattner 1989). Natural constraints upon travel took the form of forests, difficult terrain, and seasonal extremes like monsoon rains (e.g. see Deloche 1980). It appears, thus, that trade took place on an opportunistic basis, in which traders and

travelers exchanged information about appropriate trade routes, traveled in groups for safety, and altered their schedules to avoid times of seasonal weather extremes.

The flexibility of travel schedules under these types of natural and political conditions is illustrated in both early historic and colonial-period documents. In the early centuries B.C., when the Buddhist ethic was gaining in popularity, it was manifested in the construction of monasteries; these monasteries were to be inhabited during the rainy season, so that monks and nuns would have a home during the time when travel was impractical (Barnes 1995). Early European travelers' reports for the subcontinent during the period prior to unification under colonial rule also cite numerous examples of multiple routes: the specific route for any given journey was calculated on the basis of the current political regime in the region, the level of perceived banditry, the height of rivers and the location of fords, and hospitable places for overnight stops (e.g., Colebrooke 1790). Thus, the challenging conditions of both the physical and the political landscape were factors in establishing the route and time of travel for any particular journey, but did not serve as deterrents to movement.

The distributions of common goods such as shell ornaments and coins throughout sites of the Early Historic period indicates that contact between regions occurred. The adoption of Buddhism with its common iconography, and

the copying of exotic goods in local materials (such as the copying of Roman coins in clay for use as ornaments) in this period further suggests that peoples in different parts of the subcontinent shared information about the symbolic value of goods as well. Yet although these goods are nearly ubiquitous in sites of the Early Historic period, they are still relatively rare and are represented by few exemplars at each site. To fully examine the trade networks which linked people across the social landscape and provided the means of social distinction within social groups, more abundant classes of evidence must be critically examined. Such evidence can be found in the workings of local trade networks, where the full range of consumed items can be assessed.

## Sites in Vidarbha

The choice of the Vidarbha region of central India for the examination of a local trade network was based on several considerations. First, a substantial amount of archaeological activity has been carried out in this area in the past forty years, providing evidence for common material culture shared by a number of sites of different sizes and configurations. Secondly, the central subcontinent appears to be an area which was actively traversed in the Early Historic period, but it was not the seat of any large-scale polity which could have sustained a

political organization sufficient to facilitate or promote the use of a common material culture (see figure 4.1). Finally, the apparent lack of population growth in the period following the Early Historic era indicated that the settlement activities of the Early Historic period could be detected and studied from surface remains still visible.

The majority of the archaeological work which has been undertaken in the Vidarbha area has been on the megalithic sites which are common to the region (figure 5.6). These megalithic sites, often in the form of grave-circles, are sometimes associated with neighboring habitation deposits. As of 1992, about 15% of the ninety known megalithic sites in Vidarbha have been subjected to some excavations, although not all of the sites have been formally published (Thomas, 1992).[2] An estimate of the total number of burial circles (n=2831) is given by a slightly later publication, in which it is stated that 69 of these have been "exposed" [excavated] (Mohanty and Walimbe 1993; see also Mohanty and Walimbe 1996). Although the percentage of excavated megaliths is relatively low, the information gathered from those excavations indicates the range of goods utilized. When combined with the information from habitation sites of the same period, a more complete picture emerges.

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[2]Excavations in press include those at Borgaon, Khairwada, Bhagimohari, and Hingna Raipur (as reported by Thomas, 1992).

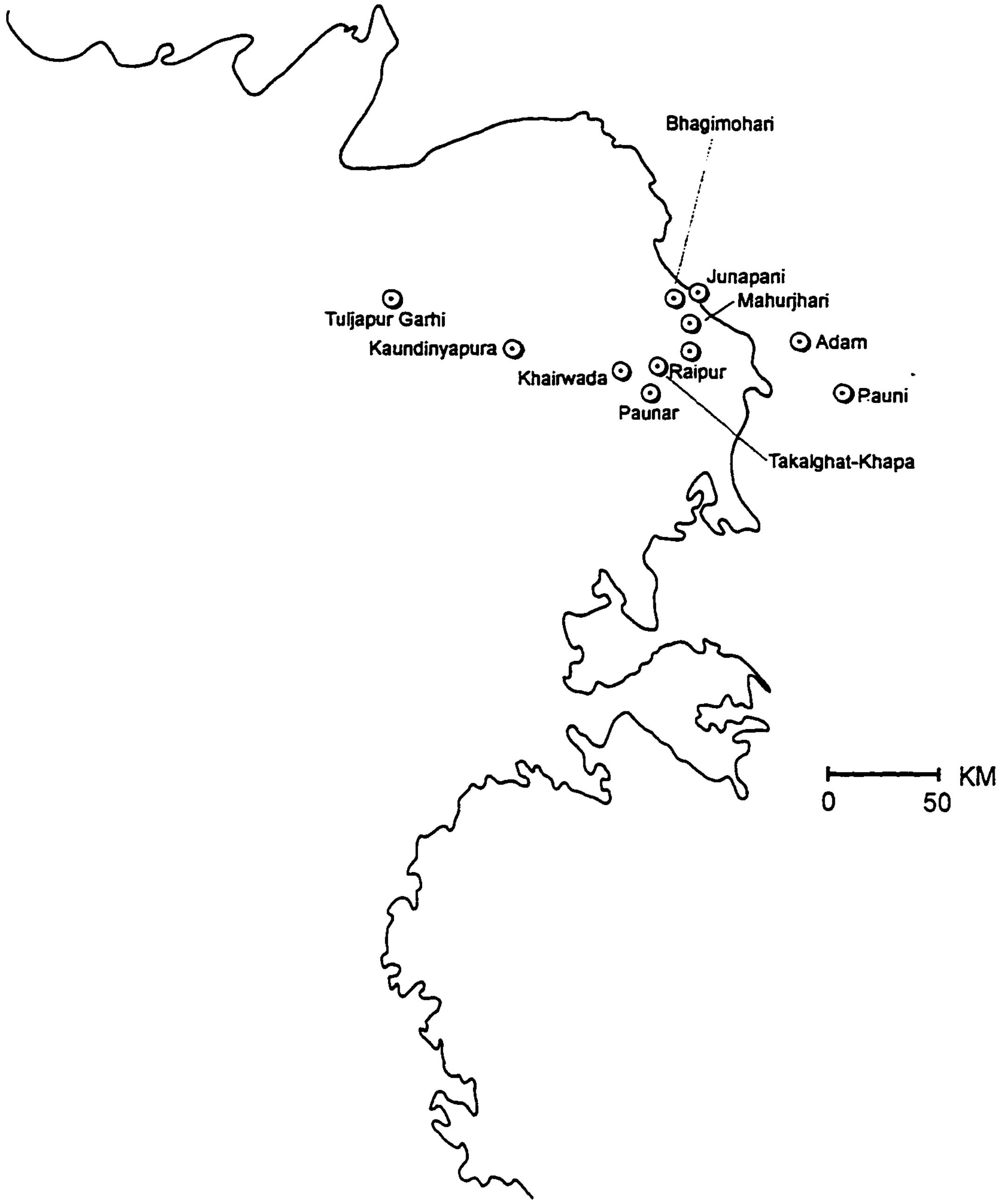


Figure 5.6. Megalithic and Early Historic sites in Vidarbha with substantial excavated components. The line shows the edge of the Deccan basalt province in Vidarbha, with the area to the left of the line being the easternmost extension of the Deccan basalts in central India.

Mahurjhari, located 15 kilometers west of Nagpur, consists of four localities containing at least 150 stone circles (Deo 1970). From 1970-72, a total of 15 megaliths were excavated from the four localities (Deo 1972); in 1979, renewed excavations recovered the remains of 15 additional individuals (Lukacs 1981). The site is interpreted as a bead-production site, as a large number of beads have been recovered from the excavation as well as surface investigation; in one excavated locality, three stone circles produced a total of 380 beads of different materials. Deo observes that "No habitational remains of the megalithic culture could be encountered nearby the Stone Circles," but that there does exist a habitation of the early historic period nearby (Deo 1972:3).

However, the juxtaposition of burials with habitations at this site may be reinterpreted, especially as the chronology for the site is difficult to determine (while Deo suggests a date of 6th-7th century B.C., there were no C14 or other dating methods utilized; Deo 1972). Therefore, the distinction between the artifacts at the habitation area and recovered in the megaliths may reflect differences in symbolic and functional usage between burial goods and domestic goods from the same time period. Such a distinction in material culture between contemporaneous deposits is noted at Takalghat and Khapa, where the cultural assemblages are similar in both mortuary and domestic contexts except that the stone circles lack the

painted pottery and terracotta objects found in the habitation site (Deo 1970).

Also west of Nagpur, at a distance of 36 kilometers, is found the site of Takalghat-Khapa, where excavations in 1968-69 recovered megalithic burials (at Khapa) and contemporaneous habitation deposits across the river (at Takalghat; Deo 1970). At both sites, a variety of iron objects were recovered, including ornaments, projectile points, nails, and utensils such as ladles, knives and chisels (Deo 1970). This list of iron objects is similar to those found in three megaliths excavated at Gangapur, located two kilometers northwest of Takalghat (Deo 1970). As in the case of many other megalithic sites in Vidarbha, the megalithic circles at Khapa contained only human and horse bones, while the faunal remains from Takalghat indicated a variety of domestic animals including sheep, chicken, goat, cow and pig (Deo 1970; see also Thomas, 1992).

Another site similar to Takalghat-Khapa in containing both habitation and megalithic components is found at Naikund, located 42 kilometers northeast of Nagpur. At Naikund, 53 stone circles in four localities were reported by Deo and Jamkhedkar; of these, a total of four were excavated along with portions of the habitational mound in two seasons of work (IAR 1977-78 1979-80). While both the mortuary and domestic contexts contained similar pottery, the habitation contexts contained a variety of different

domestic fauna compared with the stone circles which had only horse and human bones; in addition, the stone circles contained a significant quantity of copper objects while copper was not represented in the domestic portion of the site (IAR 1977-78). Significantly, this site produced the first evidence of iron-smelting in the megalithic period in Maharashtra, with the recovery of iron slag, crucibles and a furnace at a distance of 50 meters from the habitation mound (IAR 1979-80).

Another megalithic site, Raipur, is located at 15 kilometers southwest of Nagpur and consists of a total of 262 stone circles in an area of 10 hectares (Deglurkar and Lad 1992). The site is noted as being exclusively a burial site; eight of the megaliths were excavated from 1984 to 1990 to produce the material for the report. All of the megalithic circles contained some iron; in addition gold was recovered in two of the circles. Copper was also abundant, being recovered in the form of utensils, horse-trappings, and ornaments (including 46 bangles). In contrast to this abundance of metals, items of stone were rare, being limited to two cylindrical stone pounders. The megalithic circles also produced a number of beads, though the types of material (agate, jasper, crystal, carnelian) was not evenly distributed among the megalithic circles (Deglurkar and Lad 1992). No chronological information is offered for the site, but in the faunal analysis Thomas suggests that the site probably dates to between 900-300

B.C. (Thomas 1992).

Bhagimohari is another site which contains both stone circles (a total of 70) as well as habitation deposits; a total of three stone circles and two trenches measuring 4 x 3 meters were excavated (IAR 1982-83). Excavations revealed grain storage and hearths associated with what appears to be large houses, all indicative of an agricultural-based economy with animal husbandry, supplemented by hunting and gathering (Mohanty and Walimbe 1993).[3] They also note that "the occurrence of a large number of agricultural implements as grave goods, further substantiates this hypothesis" (Mohanty and Walimbe 1993:95).

A view of a mixed economy in the megalithic period is also offered by Lukacs, whose detailed study of teeth from the Mahurjhari excavations indicates that the rate of caries (tooth decay) is similar to that found ethnographically among groups practicing a mixed economy (Lukacs 1981). The site of Bhagimohari, dated by radiocarbon to 750-450 ± 100 B.C., was found to have a high proportion of bone tools, suggesting that metals were scarce; of the 556 bones analyzed, 46% consisted of cattle bone, although there were also wild fauna present (Thomas 1993). However, it should be noted that the excavations

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[3]Note however that the report in Indian Archaeology, A Review indicates that the houses were circular (IAR, 1982-83).

were extremely small, amounting to two 5 x 5 meter trenches (Thomas 1993).

Another very large site with megaliths and habitation deposits is located at Khairwada, with a total of 1400 stone-circles spread out over an area of 13 hectares (IAR 1981-82). Although the report of this excavation, carried out in 1981-82 after an extensive mapping project, is still in press, some details of the findings are available. Both the habitation and the megalithic areas contained similar pottery, with the habitation area showing considerable investment in domestic furniture in the form of lime-plaster floors and elaborate legged grinding stones (IAR 1981-82). The layers identified as "Early Historic" yielded a number of iron tools as well as beads of semi-precious stones (IAR 1981-82).

The habitational site of Paunar, now located under a modern village, provides additional information about architecture of the Early Historic period in this area. The single large trench of the excavation (30 x 20 meters) recovered from Period IIA (4th/3rd century B.C. to the first century B.C.) a large portion of a single lime floor measuring 23 x 12 meters (Deo and Dhavalikar 1968). In the subsequent IIB period (first century B.C. to 2nd/3rd century A.D.), there were in addition to lime floors other architectural elements such as ring-wells and roof-tiles, as well as storage jars (Deo and Dhavalikar 1968).

Other sites of the megalithic and Early Historic

periods in Vidarbha have been investigated only briefly. Bhatkuli, located in Amravati district, was investigated by M.G. Dikshit, probably in the 1960's, producing a report only on the limited sample of plant remains which were estimated to be of the Early Historic period (Vishnu-Mittre and Gupta 1968-69). Arni, in Yavatmal district, was excavated in 1978-79 and again in 1984-85, and found to contain remains of the megalithic through the "Satavahana" period (IAR 1978-79; 1984-85). Junapadi is known to have contained more than 300 stone circles (Deo 1970). In 1961, three of the megaliths were excavated, revealing a variety of funerary deposits, including human and horse bones, iron objects, micaceous and other pottery and gold ornaments (IAR 1961-62). Other sites in Vidarbha are also reported to contain megalithic and early historic remains, including the site of Arsoda (in Gadhchiroli district; IAR 1984-85).

The apparent level of socio-political complexity in the Vidarbha region in the Early Historic period is relatively low. Indicators of centralized wealth and labor investment as manifested in monumental architecture or town planning, are difficult to determine from the generally limited investigations of habitation sites. Some evidence for labor-organization is seen in the construction of megalithic monuments, such as those found at Junapani, Mahurjhari, and Takalghat-Khapa. An experimental reconstruction of the filling of a megalith was undertaken recently in Vidarbha by Mohanty and Walimbe based on the

size and composition of one boulder-ringed burial at Bhagimohari (Mohanty and Walimbe 1996).

Based on their observations, they calculated that a total of 230 human-days would have been required to construct the megalith; with this level of labor investment, the authors conclude that "the burial practice was restricted for a certain group of people and definitely not every member of the community was accorded such ceremonial departure" (Mohanty and Walimbe, 1996:144). The logistical demands of organizing such a workforce indicates the potential for event-specific, and perhaps continuous, hierarchical social organization. The quantity and variety of wealth-objects associated with megalithic burials, such as iron, copper and gold implements and ornaments, also vary from one site to another. While such differences may be a chronological marker rather than a social marker, there is also the distinct possibility that even between individuals accorded megalith-status at burial there may have been a further division in status as exhibited in burial goods.

A further indicator of the ability to amass labor-power is found at the site of Kotra, about 225 kilometers northwest of Kaundinyapura. At that site, investigated in 1988-89, the investigator noted in period III (750-300 BC) that there was a massive mud wall measuring 2.39 meters wide (IAR, 1988-89). Although there are indications of large-scale defensive constructions in the Early Historic

period in the Gangetic valley, the suggestion of such a construction closer to Vidarbha again suggests that social groups could be organized to build architecture on a larger scale.

The economic activities of the megalith-builders can be reconstructed on a variety of grounds. Detailed studies of the faunal and botanical evidence associated with habitation sites as well as the megalithic constructions indicate the use of both agricultural resources and domesticated animals. Thomas refers to plant cultivation and says that at Bhagimohari, in general, "the economy was based on a combination of agriculture and cattle pastoralism, augmented by hunting and the exploitation of aquatic and avian resources." (Thomas 1993:117). A mixed economy during the megalithic period in Vidarbha is explicitly stated by Thomas (1993) on the basis of faunal evidence, and further substantiated by Lukacs (1981) from the investigation of human dental evidence, and by Mohanty and Walimbe (1993) on the basis on archaeological evidence.

## Conclusion

The rich body of data available from the archaeological investigation of sites in the Indian subcontinent provides ample evidence for the ongoing contact of peoples and groups starting in the late first millennium B.C. Although political constructs may have lacked long-term

stability, other cohesive social mechanisms such as religious groups and merchant groups provided the organizational structure for the production and distribution of goods. The demonstrated presence of a common material culture in a regional social system, such as can be demonstrated in Vidarbha, sets the stage for the examination of how individual population centers participated in the trade network, and how exchange goods were distributed at those sites. In the following chapters, the examination of an individual trading site is undertaken, with a view towards reconstructing the total exchange network of perishable and non-perishable goods.

# CHAPTER VI

# SURFACE SURVEY AT KAUNDINYAPURA AND ITS ENVIRONS

In this chapter, the technique of systematic surface survey is discussed with reference to the use of such survey to investigate sites in their entirety. Systematic survey and collection permits the examination of medium and large-sized sites at an equal level of intensity, providing data to evaluate the distribution of different consumption activities. A discussion of the particular benefits and limitations of surface data is followed by the explanation of the methodology and collection strategies utilized in the recovery of archaeological materials at the site of Kaundinyapura and its surrounding territory in central India.

## Surface survey and artifact recovery

Surface survey as a technique for addressing large-scale archaeological questions was initially developed as a means of discovering sites previously unknown to researchers, often in the vicinity of larger, well-known sites. The study of a site's geological and topographic landscape is a logical extension of inquiry about the ancient past,

so it may be said that "surveys" have always constituted a part of the archaeologist's method of study. By the nineteenth century, surveys were made more systematic through the examination of landscapes in their entirety, with the principal emphasis one of chronology and the determination of how many sites were occupied simultaneously (Willey and Sabloff 1980). In the early twentieth century, surveys were assisted by the use of aerial photography, often combined with on-the-ground reconnaissance at various scales of intensity, from road-based travel serving to locate large sites, to the use of more-intensive methods of pedestrian coverage, such as surveys in which individuals walk the landscape and record the presence of archaeological materials noted on the ground surface.

In addition to being a technique for discovering previously-unknown sites, surface survey is also a technique which enables new questions about the relationships between those sites to be addressed. The use of surface survey to explore the settlement patterns of an ancient landscape is most closely associated with the pioneering efforts of Gordon Willey in the Viru valley of Peru (Willey 1953). With modifications and refinements, the technique of surface survey has subsequently been utilized throughout the Old and New Worlds (e.g., Adams, 1981; Adams 1965; Alcock 1991; Cherry, Davis and Mantzourani 1991; Runnels and van Andel 1987; Sanders, Parsons

and Santley 1979).

Just as the interpretation of excavated contexts requires an understanding of the way in which archaeological deposits have been affected by post-depositional activities, the interpretation of the archaeological surface record requires attention to the ways in which landscapes are modified by continuous human or natural activity. Methodological issues regarding survey have largely concentrated on the question of site recognition and site definition. The recovery of artifacts which indicate the presence of ancient activity areas may be hampered by geomorphological changes, such as alluviation or inflation, the visible effects of which may vary seasonally according to vegetation cover. The visibility of artifacts and structural remains also increases or decreases according to modern landscape modifications such as plowing (see Terrenato and Ammerman 1996). Factors of visibility vary depending on the scale of investigation, from aerial or road-based survey in which the largest sites will be most apparent, to intensive and systematic groundwalking which recovers evidence from much smaller occurrences.

The interpretation of human cultural activity from visible surface remains is a domain fundamentally different from the interpretation of excavated deposits. While precise determinations of spatial organization and usage can be made for excavated contexts which are firmly

anchored in a three-dimensional frame of reference, surface remains comprise a two-dimensional distribution. The relationship between surface materials and subsurface archaeological deposits involve unknown (and sometimes, unknowable) aspects, such as the depth to underlying deposits and the degree to which surface materials have been vertically mixed by post-depositional disturbance. In addition, as noted above, there is the potential for natural forces such as alluviation and erosion to affect surface deposits. The surface of the earth is constantly modified, where the environment, people and artifacts are "continually interacting components of a single system" (Ebert 1992:11). Because succeeding generations of landuse rearranges the surface archaeological record, vestiges of ancient activity areas are not always discrete and "the archaeological record is likely to consist of a virtually continuous spatial distribution of material over the landscape, but a distribution extremely variable in density" (Cherry 1983:395, emphasis in original).

One important post-depositional effect consists of plowing. Areas which are plowed present particular opportunities and constraints: the appearance of surface remains will differ based upon whether such a site is deeply plowed or covered by post-occupational alluvium, and whether the agricultural lands in which the site is located have been 'manured' by the addition of later refuse (see, e.g., Wilkinson 1982). Experimental plowzone studies have

attempted to quantify the level of representation provided by surface materials at different times of the year and under different conditions of visibility. One important early study was conducted in Calabria, Italy, where a plowed surface was deliberately "planted" with small modern ceramic tiles to evaluate the rate at which a known number of items would afterwards be visible on the surface of the ground (Ammerman 1985).

The results of this study, in which the field containing the items was subsequently revisited 6 times, indicated that for every tile visible on the ground there were 14 to 23 which were subsumed into the plowzone (Ammerman 1985). In addition to plowing, which moved the tiles laterally and vertically, other factors such as slope and vegetation affected visibility. Ammerman's study of physical processes shows that the surface at any given time "acts in effect as a sampling process with respect to material circulating in the plow-zone" (Ammerman 1985:34).

**Surface survey and site recovery**

Fieldwork and recording strategies have been developed to maximize recovery and to enable researchers to predict the total number of ancient use-loci from currently-visible remains; these strategies have ranged from the selection of research areas using statistical sampling strategies derived according to selection criteria (such as environ-

mental zones), to "full-coverage" surveys which address an entire landscape at an equal level of intensity (for a summary, see Fish and Kowalewski 1990). The intensity of survey coverage affects the recovery rate of artifacts and sites, since the amount of recognized artifacts increases proportionately to the amount of area investigated. However, the number of "sites" will vary according to the intensity at which the ground surface is examined (Plog, Plog and Wait 1978). For example, a pedestrian transect survey in which people walk at intervals of 100 meters should capture all sites of 100 meters or larger, although it will omit some of the sites in the smaller size ranges. Survey methods should always be explicitly stated, so that future researchers can evaluate the survey's efficacy in capturing different kinds and sizes of cultural manifestations.

The number of "sites" will also vary according to the criteria utilized to identify artifactual or structural occurrences. A "site" can be defined as "a discrete and potentially interpretable locus of cultural materials" (Plog, Plog and Wait 1978:389), but the size and boundaries of that locus are established at the discretion of the investigator. The threshold for the identification of a "site" varies from project to project and from one research area to another, and may reflect the research goals of the project as well as accepted conventions and past usage in a particular geographical area. The minimal threshold for

the definition of a "site" may also vary with the expected densities of artifacts associated with sites of different time periods. for example, for cultural periods of low population density, an investigator may decide that a "site" is to be defined on the basis of few artifacts; for epochs associated with high population densities, the minimal number of artifacts could be set considerably higher (for an example, see Keay and Millet 1991).

The identification of sites and the delineation of site boundaries based on surface remains is often a difficult issue in survey archaeology, where researchers must establish a threshold for the identification of "sites" as meaningful cultural or analytical units against a landscape of continuous artifact distribution. One rather extreme solution to this problem has been utilized by projects which eliminate the judgement of sites and site boundaries from the recording process, instead allowing for the recording of individual artifacts which are later grouped into "sites" in the laboratory (often with the aid of computer programming to cluster artifacts in space) (e.g., Ebert 1992; Gaffney and Tingle 1985; J. Wright *et al.* 1990). This approach however entails several significant disadvantages, including the time spent in recording of individual artifacts as well as the long waiting-period prior to assembling a tally of sites and their locations. In addition, the presence of "background noise" (artifacts dispersed throughout the landscape) means

that the threshold of minimal size and/or density which qualifies as a "site" must still be determined by the investigator. In sum, there is no single "scientific" or "best" method to unambiguously determine the number and size of sites in any given survey area; regardless of whether site-definition is carried out during or after fieldwork, the criteria by which a "site" is identified should be clearly articulated.

Equally important for the interpretation of ancient lifeways and patterns of cultural interaction is an allowance for "empty" space. Even if artifact-free areas are determined to be a result of conscious avoidance (rather than postdepositional processes which have removed traces of ancient usage), there is no need to see such areas as being "unimportant zones of the landscape", as phrased by Bintliff and Snodgrass (1991). Some active economic uses of the landscape leave few or no archaeological traces, such as gathering of natural resources or pasturing of animals; likewise, the temporary dwellings associated with these and other seasonal or occasional activities may be archaeologically invisible. In addition to economic activities, the symbolic and ritual use of space may actively include cultural categories of "empty" space; such space may also have served as buffer zones between cultural groups.

In sum, the interpretation of ancient cultural materials in the modern landscape must be undertaken with

particular attention to the activities, both natural and cultural, which have affected that landscape. However, the judicious use of survey techniques provides a wealth of information about the relationship of sites to each other and to the surrounding landscape, enabling the reconstruction of cultural integration and economic activities. Even for periods in which documentary evidence can be cited, archaeological investigation provides information about large-scale economic patterns for which textual sources are often silent. Small sites and special-purpose sites are especially absent from the documentary record, though they may perform critical roles in providing rural support for growing urban centers. Textual sources, often written from the centers of authority and sometimes containing a prescriptive as well as a descriptive element, may paint a uniform picture of prosperity; archaeological investigation may reveal that even in times of general well-being, some areas of a polity may be neglected and relatively impoverished.

As indicated earlier, an initial impetus for the development of survey techniques in archaeology was directed towards recovering the cultural landscape around large sites. But the regional surveys which documented the presence and density of sites throughout a landscape in turn posed questions about the nucleated settlements whose presence affected human activities in rural areas (Bintliff and Snodgrass 1988). As a result, the same techniques of

investigation have been utilized on single sites, with surface survey undertaken to systematically document the distribution of artifacts and other cultural remains. Such investigations have often been conducted systematically prior to, or in conjunction with, excavation. Given the logistical constraints usually faced by archaeologists working on large sites, such as the costs of excavation and the requirements of artifact storage, excavations can generally only be carried out on a limited area of a large and complex site. Systematic surface investigations can assist in the choice of excavation areas by identifying areas whose surface remains indicate promising areas for further investigation (Redman and Watson 1970).

Since the early 1980's, systematic surface surveys have been carried out on large sites throughout the world. The first goal of these surveys was to document the sizes of sites through time, to assess patterns of growth which affected the use of surrounding areas (e.g., Alcock 1991; Mattingly 1992). In addition to recording the growth of central places, surface artifacts from individual sites can also address questions about the economic and social organization of a site, enabling the investigation of "details of its internal organisation within a spatial-behavioural framework" (Walker 1984:87). The investigation of larger sites and their surrounding areas also invites the reconsideration of what constitutes a "site", since a large urban area may be composed of distinct subzones (for

example, at large urban sites such as Vijayanagara (Morrison 1990; Sinopoli 1990)). As in the case of distinguishing "sites" from background noise, the investigators must decide at which point the density or spacing of artifact clusters is sufficiently great to label them a separate site, when they occur on the apparent boundaries of large sites.

As observed by Walker, surface survey as a technique developed for regional analysis is tailored to suit a scale of resolution which is typically larger than a single site (Walker 1984). This difficulty can generally be resolved by utilizing more closely-spaced intervals for fieldwalking and sampling. Postdepositional disturbances may include both the addition of later materials and the removal of archaeological deposits, such as artifact or matrix collection for reuse in modern construction. Sites which are located away from modern habitations or which do not appear to have been greatly disturbed by subsequent activity, or which have architectural remains visible on the surface activity, may present a more intact series of surface artifacts. In general, geomorphological evaluations, and observations of modern behavior around sites, are critical in assessing the extent to which surface remains have predictive value. The longevity of site use also affects the interpretation of site growth over time, since artifacts from the latest occupations of the site are likely to be more visible and evaluation of

the extent and composition of the earliest occupational periods is therefore compromised by later additions.

The types of surface materials encountered also affect the predictive capacity of the survey; for example, while standing architectural remains may indicate aspects of spatial organization for an ancient site, the find-spots of portable objects does not safely allow the inference of the locations of the structures to which they originally belonged. Investigators have made considerable claims for surface survey on large sites, including the ability to reconstruct the orientations of buildings based on artifacts from the plowzone. In their survey of the 28-hectare site of Peñaflor in the Guadalquivir valley of Spain, one group of authors suggested the presence of a colonnade based on the recovery of a line of clay column fragments found on the site surface (Keay, Crieghton and Jordan 1991). However, the reuse of architectural elements by later peoples, including the transport of fill for the leveling of new building sites, means that patterns of loose architectural remains must be interpreted with caution.

**The relationship of surface remains to the subsurface**

Methodological advances in survey strategy, such as resistivity surveys and other types of remote sensing have been used to evaluate the proposal that patterns in surface

artifacts can be matched to underlying architectural remains. Subsequent excavations of surveyed areas have also evaluated the extent to which surface artifacts can predict specific subsurface structures. At sites in Turkey, both Redman and Watson (1970) and Whallon (1979) found that controlled surface collections accurately predicted the information gathered from subsequent excavations. However, the accuracy of surface collections also reflects postdepositional processes, so that subsurface predictions must account for subsequent site use and disturbance.

In one study which evaluated the utility of fine-scale surface reconnaissance, one zone of the Roman port site at Leptiminus, Tunisia, was chosen for excavation based upon a concentration of surface artifacts indicative of ceramic production (Smith in press). Prior to excavation, the area, within a single modern olive field, was the subject of a detailed surface assessment utilizing a 2 x 2 meter grid to count all artifacts; this grid was later used as the basis for excavation units. Two important observations were made: the quantity and variety of surface ceramics were not matched by subsurface finds, and secondly, the presence of a N-S wall suggested by a linear series of plaster fragments was found, at 80 centimeters below ground surface, to emanate from an E-W wall (Smith in press).

In general, the small-scale or precise modeling of site characteristics based on surface remains is a

problematic venture. It is probably more accurate to suggest that patterns in surface artifacts gives a general indication of the range and diversity of materials which are present at the site. In the absence of standing architectural remains, activities which are based on large-scale, repetitive actions involving material goods are those most likely to be systematically recovered through a surface assessment. Examples of such actions include habitual consumption or production activities which produce debris such as domestic trash and waste-products such as debitage and slag. Thus, the principal variety of information which can be recovered from surface survey at individual sites is economic information, about the way in which the inhabitants of the site acquired and utilized material goods in the fulfillment of regular requirements for subsistence and social interaction.

Surface survey at large sites also assists in providing economic information through the identification of the number and relative sizes of specialized activity areas and features present at a site. Concentrations of production waste indicate the ways in which space was organized for production activities; the assessment of artifact diversity and of co-occurring artifact classes allow the association of different types of production with different sectors of the site. The remains of consumption activities also provide a substantial component of visible surface remains, with the surface of the site often

providing a palimpsest of all the durable goods used during the life of a site. These artifacts indicate how a site was linked with other sites through traded items; within the site, the distribution of artifacts indicates relative access to local and non-local goods. If some artifact classes, or co-occurrence of classes, are interpreted as indicators of wealth, different portions of the site may be associated with different social groups--an important link in the evaluation of social and economic ties between sites at periods of social change such as increased socio-political complexity and the formation of integrated polities.

**Background for survey in central India**

As indicated in the previous chapter, a great deal of archaeological fieldwork has taken place in the Indian subcontinent to identify sites and to evaluate the presence of medium- and long-distance trade goods at sites. These investigations have been based upon two methods of investigation: excavation and "exploration". Excavations of Indian sites ranges from large-scale, deep excavations at large sites, to test excavations of a very limited size on sites of all sizes. Excavations frequently concentrate on the most prominent (often mounded) portions of the site, and may be constrained in areal extent by the presence of modern habitations adjacent to or built directly upon

archaeological remains. Large excavations are usually published as monographs, either through the Archaeological Survey of India as the permit-granting authority for the Government of India, through academic presses connected with universities housing departments of archaeology and ancient history, or by state departments of archaeology. Smaller excavations and preliminary reports are often published as journal articles in national or regional periodicals specializing in archaeology, or as contributions to felicitation or commemoration volumes. While in progress, excavations are also noted in the yearly publication of the Archaeological Survey of India, Indian Archaeology, A Review.

"Exploration," in the Indian archaeological context, describes the process of enumerating sites and providing a description of site chronology based on the presence or absence of diagnostic artifacts (usually ceramics). Sites noted during "exploration" are usually found by two means: through the investigation of mounds and standing remains noted while traveling by road, and through the questioning of villagers about known remains and recovered artifacts (for an example, see Erdosy 1988). The principal venue for the publication of exploration results, usually compiled as a list of sites, their location, and the chronological periods represented, is in Indian Archaeology, A Review, though site-lists may also appear in regional journals devoted to archaeology or ancient history.

The successful application of systematic surface survey on many different types of sites in both the New and the Old World led to the expectation that a similar technique would provide information on total artifact distributions at medium and large sites in the Indian subcontinent. In 1993, the Archaeological Survey of India accepted this author's proposal to investigate an ancient site through the collection and analysis of surface remains. Permission was granted by the ASI to study the site of Kaundinyapura, located approximately 100 kilometers west of Nagpur (see figure 4.4). The site was the subject of excavations in 1962 and 1964 by M.G. Dikshit, providing a sense of the types of artifacts which could be anticipated at this site (Dikshit 1968). These excavations were limited in scope, being located on the two more prominent mounds of the site (figure 6.1). However, the publication of these excavations indicated the range of materials which could be expected at the site, and that the site shared material-culture characteristics with other sites to the east (Dikshit 1968).

For the project described below, the fieldwork and accompanying laboratory work was conducted from October to December of 1994, and from September to December of 1995.

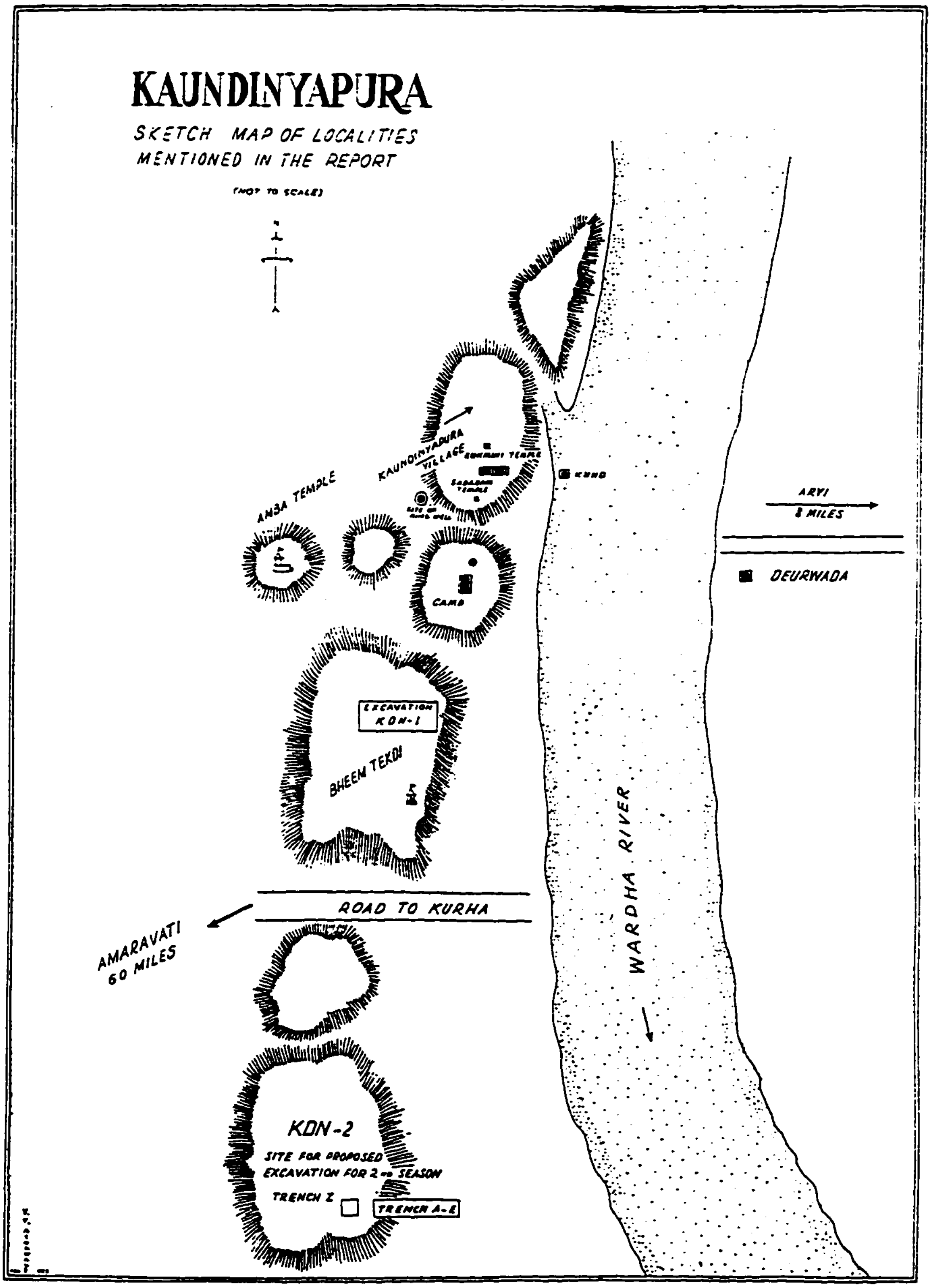


Figure 6.1. Excavations at Kaundinyapura, 1962 and 1964 (from Dikshit 1968:figure 1)

## Site formation processes and modern site impacts at Kaundinyapura

The principal focus of this survey project was the detailed surface investigation of the site of Kaundinyapura, located on the western bank of the perennial Wardha river (figure 6.2). The archaeological portions of the site are currently under a variety of different types of vegetation, necessitating survey and recovery strategies which could be adjusted to on-the-ground conditions. The southernmost portion of the site, the mound noted as KDN-II in Dikshit's report, is currently covered with very dense vegetation which was planted in the late 1960's by the forestry department (figure 6.3). This vegetation extends to the river on the eastern side of the mound; the flatlands on the west and south of the mound are plowed fields. To the north, there are two minor mounds, and a paved road which runs east-west (known as the Kurha road). This road is well south of the current village of Kaundinyapura, but prior to 1994 a new bridge began to be constructed which will connect the present portion of the Kurha road with a road on the other side of the Wardha river.

The bridge, nearly complete in late 1995, will allow greater amounts of traffic to pass through the area which will probably have a damaging effect upon the portions of the site which border the road. Currently, there is a

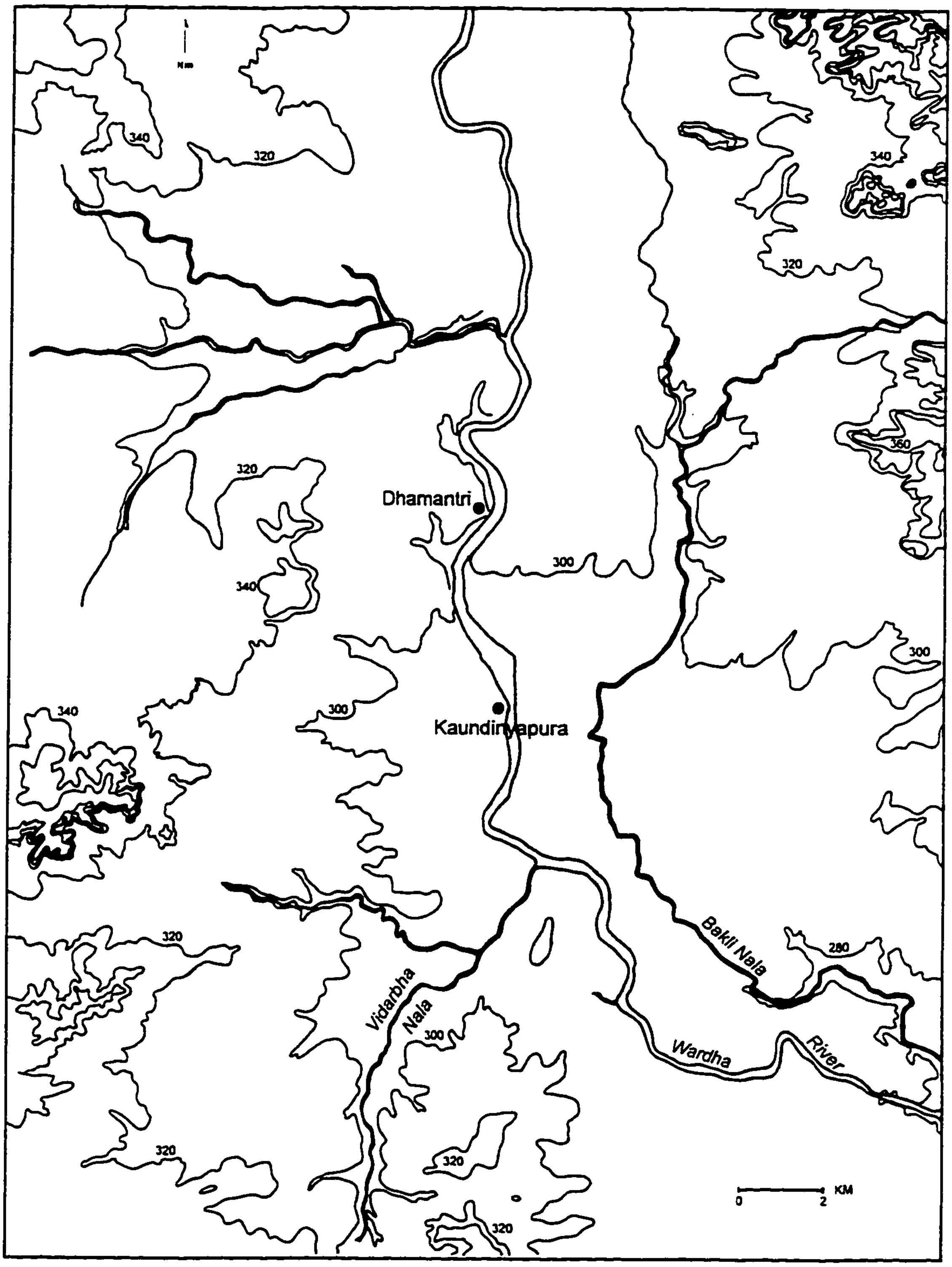


Figure 6.2. The location of Kaundinyapura in the Wardha river valley (contours in meters)

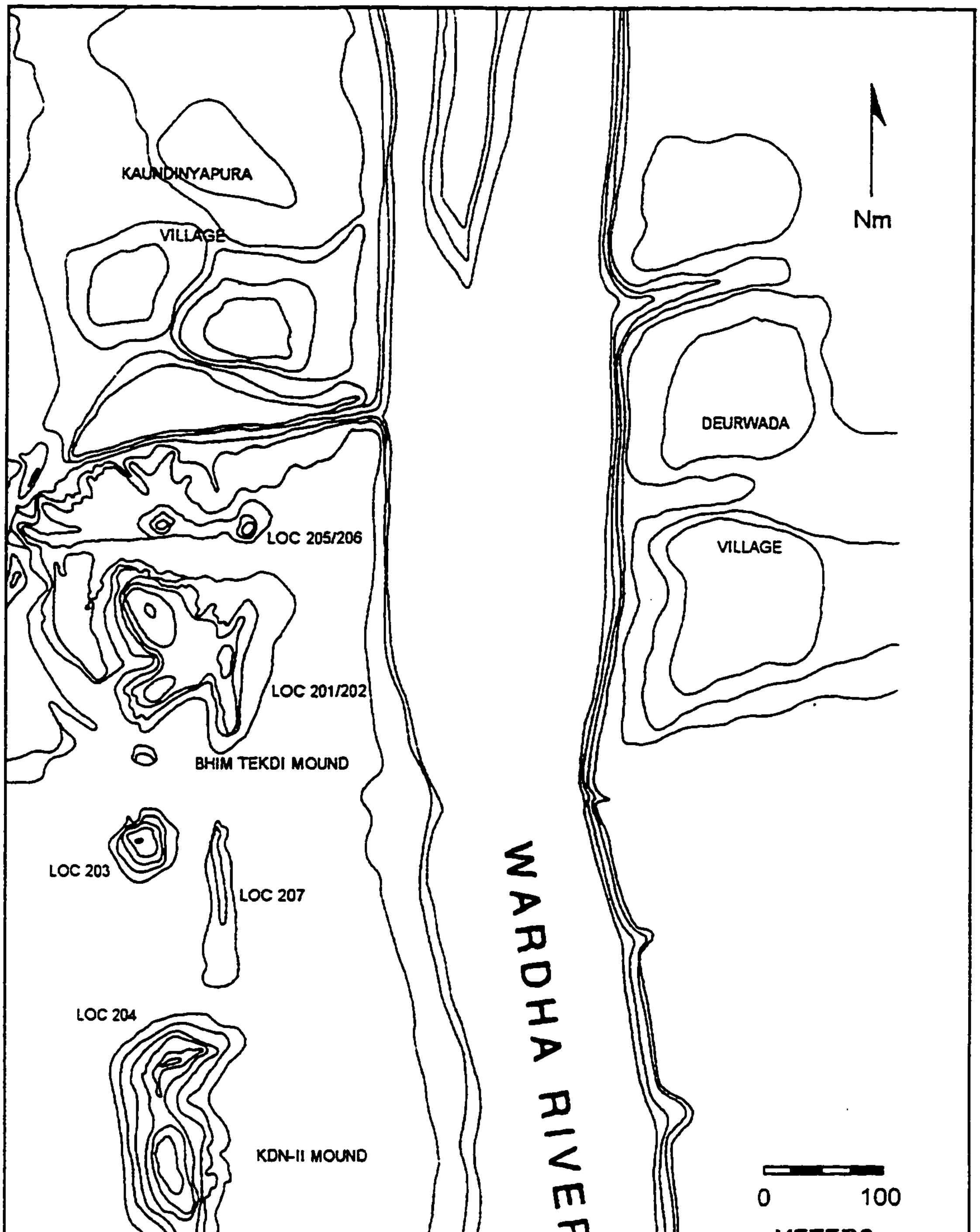


Figure 6.3. Archaeological mounds, sample areas, and location of the modern village at Kaundinyapura

small tea-stall adjacent to the road between the minor mounds; at about 800 meters west of the river, a subsidiary settlement has sprung up with a dozen houses. Both the commercial and the residential portions of the road borders will increase in size and activity with the completion of the road, which will link the two important market towns of Arvi (on the eastern side of the river) and Kurha (on the western side of the river). To the north of the Kurha road, the Bhim Tekdi mound is home to several temples and one very modest habitation. Every year, this portion of the site is also the focus of a tremendous amount of activity during the annual religious fair which attracts approximately 10,000 people to the site. During this two-week autumnal fair, the entire area becomes a temporary encampment for travelers and pilgrims who camp on the Bhim Tekdi and the river terraces.

North of the Bhim Tekdi is a abandoned, eroded zone which slopes down to a small perennial creek. This zone marks the southern boundary of the modern village of Kaundinyapura, and is used as a refuse dump by the villagers. To the north of the creek are three distinct hillocks which house the modern village; recently, the village (of about 100 households) has begun to expand to the flatter areas to the west of the three hillocks. The focal point for the modern village is the Rukmini temple, located on an upland terrace in the southeastern corner of the village.

## Surface survey at Kaundinyapura

The first area to be investigated by this project was the mound known as the Bhim Tekdi (numbered location 201 for the purposes of the 1994 survey). This mound is one of the northernmost loci of artifact distribution at the site, and is 1.3 hectares in size at present. Clearly, however, this mound was originally much larger, and has since been cleaved in two by erosional processes working at its northern edge which has now resulted in the separation of mounds to the north (labeled 205 and 206 for collection purposes). The Bhim Tekdi (201) mound was subjected to limited excavations in 1962 which produced evidence in the uppermost levels of what was termed a medieval-period architectural construct (Dikshit 1968:14).

The choice of this mound as the first area to be subjected to surface collection and artifact assessment was made on the basis of several factors. Ground visibility on this mound in 1994 was good, with vegetation being limited to short (5-10 centimeters high) grasses kept in check by grazing; the equal visibility of all parts of the mound meant that the same collection strategy could be utilized throughout, so that the logistical aspects of the actual collection process could be established and streamlined under these ideal conditions. Some erosion was noted on the western side of this mound, resulting in a good visibility of larger-size ceramics; such ceramics would be

necessary to establish categories of forms suitable for comparison with published exemplars.

In order to obtain a sample of the mound's surface which would be representative of the whole, a systematic, non-aligned random sampling strategy was employed. The relatively high density of the sherds seen on this mound suggested that a 1% sample would yield quantities of materials large enough to address questions of artifact distribution but also be of a manageable size with respect to logistical demands such as processing, transportation and storage.[1] The determination of the sampling fraction (in this case, 1%) is however only one aspect of the decision-making process; a decision must also be made about the size of the collection units. The sample sizes needed to be large enough to capture the potential variability present at each collection unit, but also small enough that the mound would be represented by enough samples to demonstrate any variability in the distribution of artifacts over the course of the archaeological site. On a practical note, it was also considered useful to have a

[1]The establishment of this sampling proportion can also be compared to surveys at other urban sites. At the Roman site of Penaflor, Spain, surface collections comprised a 1% sample (Keay, Crieghton and Jordan 1991). In the survey conducted at the very large medieval Indian site of Vijayanagara, the amount of ceramics collected averaged approximately 0.5 kg per square meter (Morrison 1990); my initial estimates of the densities on the west side of the Bhim Tekdi fell within this range.

sample unit whose measurements constituted a round number, facilitating quick calculations and summaries of data. Accordingly, an initial unit size of 2x2 meters was chosen; to achieve a 1% sample with a unit of this size, one unit needed to be placed every 20 meters in all directions.

After mapping the mound with a Brunton compass and a 100-meter tape, the resulting map was overlaid with a 20 x 20 meter grid in which each grid square had one sample unit of 2 x 2 meters randomly placed (figure 6.4). Each sample square was afterwards physically placed on the mound again using the Brunton compass and tape, with the randomly-generated point used to stake out the northeast corner of the square. The four corners of the collection square were pegged to hold a string which provided the physical boundary of the collection square. The advantages of physical boundaries for collection activities have been noted by other researchers (Whallon 1983). At Kaundinyapura the benefits were two-fold: the boundaries meant that the attention of the collector was confined to the correct-size sample unit, and the presence of strings discouraged children from entering the collection zone.

Each sample square was meticulously collected to recover all artifacts and debitage. During collection, a recording sheet was filled out for each sample square noting the vegetation cover, visibility, the presence of underlying architectural remains, and any unusual artifacts noted during the collection. This sample-recording form

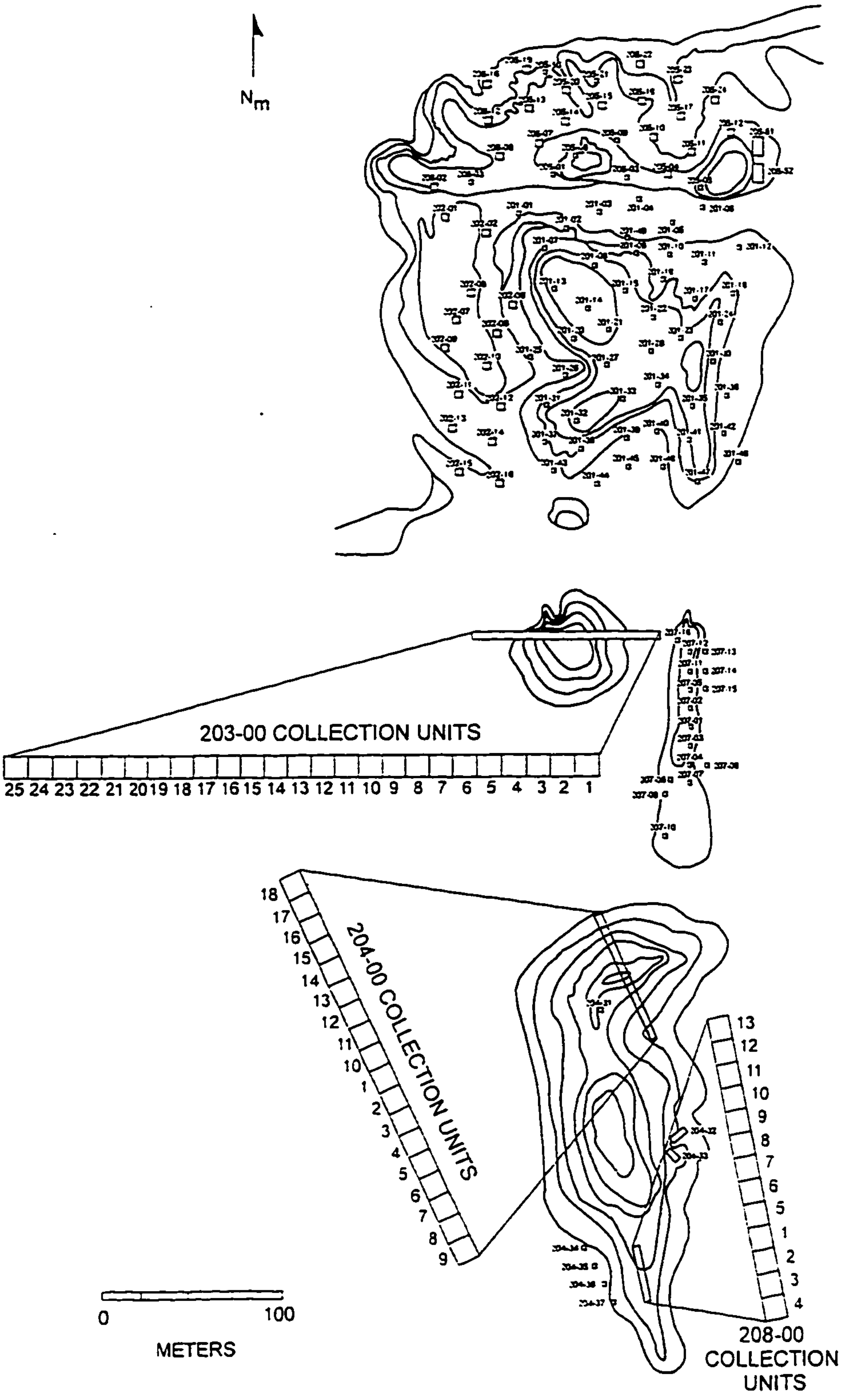


Figure 6.4. Distribution of sample units at Kaundinyapura (for enlarged maps of these areas see figures 6.5, 6.6 and 6.7)

was later utilized in the analysis of the artifact collection in the laboratory afterwards. All collected materials were placed in individual bags, to be taken to the laboratory in Nagpur for washing and identification; however, building materials (bricks and tiles) were counted and weighed at the site and returned to the exact area of the collection square. As collection progressed, there was a noted decrease in artifact density in the flatlands surrounding the mound; sample sizes were thus increased to 4 x 4 meters in the sample area 202 (to the west of 201). The sample grid was also expanded to the north in 1995, to collect the portions of the eroded area which were between location 201 and the modern village (locations 205 and 206).

The completion of the large mound (201/202/205/206) collection areas) provided a sample which could be used for predictive calculations of the sum total of artifact density and diversity on a portion of the archaeological site. The configuration of the southern portions of the site, including the 203 mound and the mound known as KDN-II, was however not conducive to this form of investigation. The very dense vegetation meant that the placement of systematic grid squares over the course of the mound would be highly inefficient; in order to assess the artifactual remains of this mound, the project obtained permission from the Archaeological Survey of India to clear the vegetation from a strip of land, in which sample units

would be placed side-by-side in a continuous row.[2] This sample strategy was first exercised on one of the minor mounds to the south of the Kurha road (location 203), in which 25 sample units each 4 x 4 meters in size were collected in a single strip (figure 6.5). The strip from 203 included several squares on either side of the mound in the farmed flatlands, to discern whether artifacts were to be found in the fields, and to assess how they might have arrived there: as materials eroding from mounds, as representative of ancient settlement in the flatlands, or as the result of active "manuring" by contemporary farmers.

Two strips were located on KDN-II, taking care to avoid the areas of the mound where the excavations had taken place. One strip was placed on the northern side of KDN-II (consisting of eighteen 4 x 4 meter grid squares in the number sequence 204) and one strip was placed on the southern side (thirteen 2 x 2 meter grid squares in the number sequence 208; figure 6.6). In addition, opportunistic samples were taken whenever visibility permitted (e.g., in areas exposed by erosion). Finally, the minor linear mound 207, to the south of the Kurha road, was sampled using a composite method: because the location of

[2]It should be acknowledged that in the Keban valley survey, Whallon notes that of the different collection methods, gridded strips were the most difficult to interpret (Whallon 1979); however this method was clearly the only means of obtaining systematic samples on the southern mounds at Kaundinyapura.

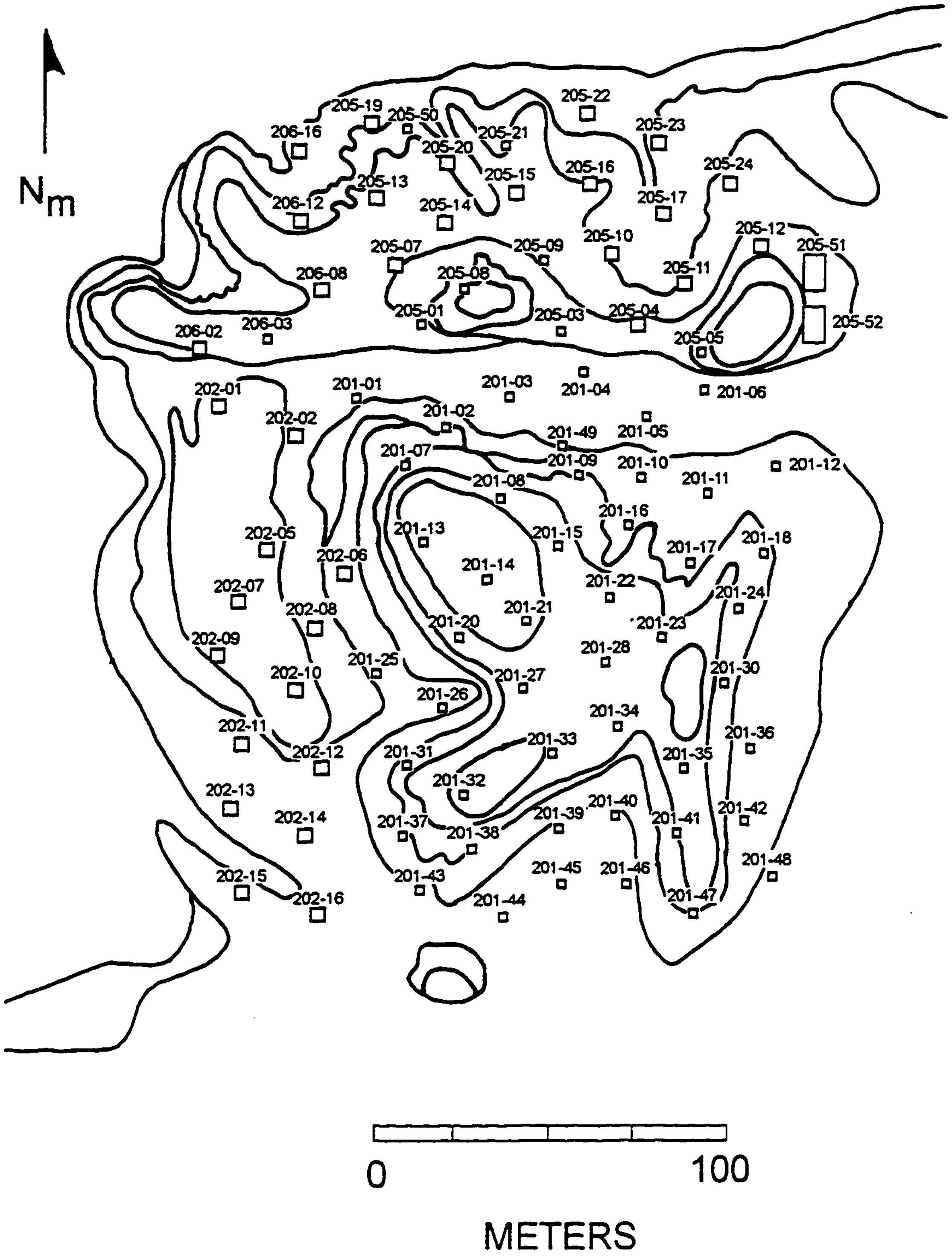


Figure 6.5. Collection units at Kaundinyapura mounds 201/202/205/206

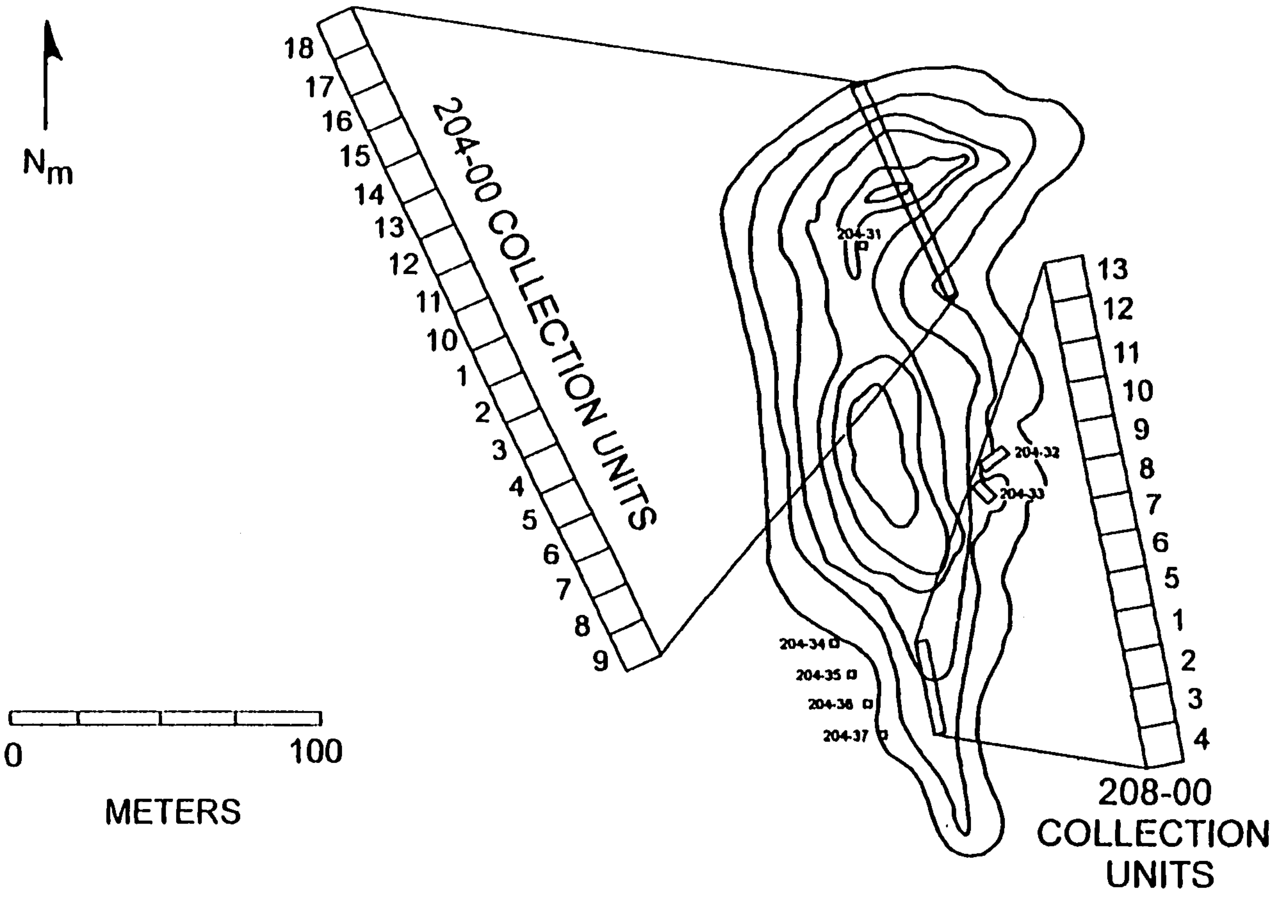


Figure 6.6. Collection units at Kaundinyapura mounds 204, 208

artifacts was greatly circumscribed, a series of 2 x 2 collection squares was placed at regular intervals to delimit the boundaries of artifact occurrence and to provide a comparative sample with the larger nearby mound at 201 (figure 6.7).

Thus, the majority of the initial collection activities focused on the mounded portions of the site. The collection of the units in the portion of the 203 strip which were in the modern field yielded little in the way of artifacts; in addition, as collection proceeded the only artifacts noted in fields consisted of modern trash. Observations of modern manuring pits filled with dung-sweepings provided an indication that fields were subject to routine additions of domestic refuse. This practice was also noted by the compilers of the 1911 Gazetteer of the Amravati district, who reported that "fields near the large towns are sometimes manured with the town sweepings" (Fitzgerald and Nelson 1983[1911]:194).

Nonetheless, a thorough search for sites in the flatlands in the immediate vicinity of the mounds was warranted to determine whether subsidiary zones of production or habitation could be found. This investigation was undertaken through a systematic program of field-walking in the vicinity of both the modern village and the mounds which constituted the ancient site (figure 6.8). This field-walking was conducted principally in 1995 and consisted of pedestrian transects walked by two persons

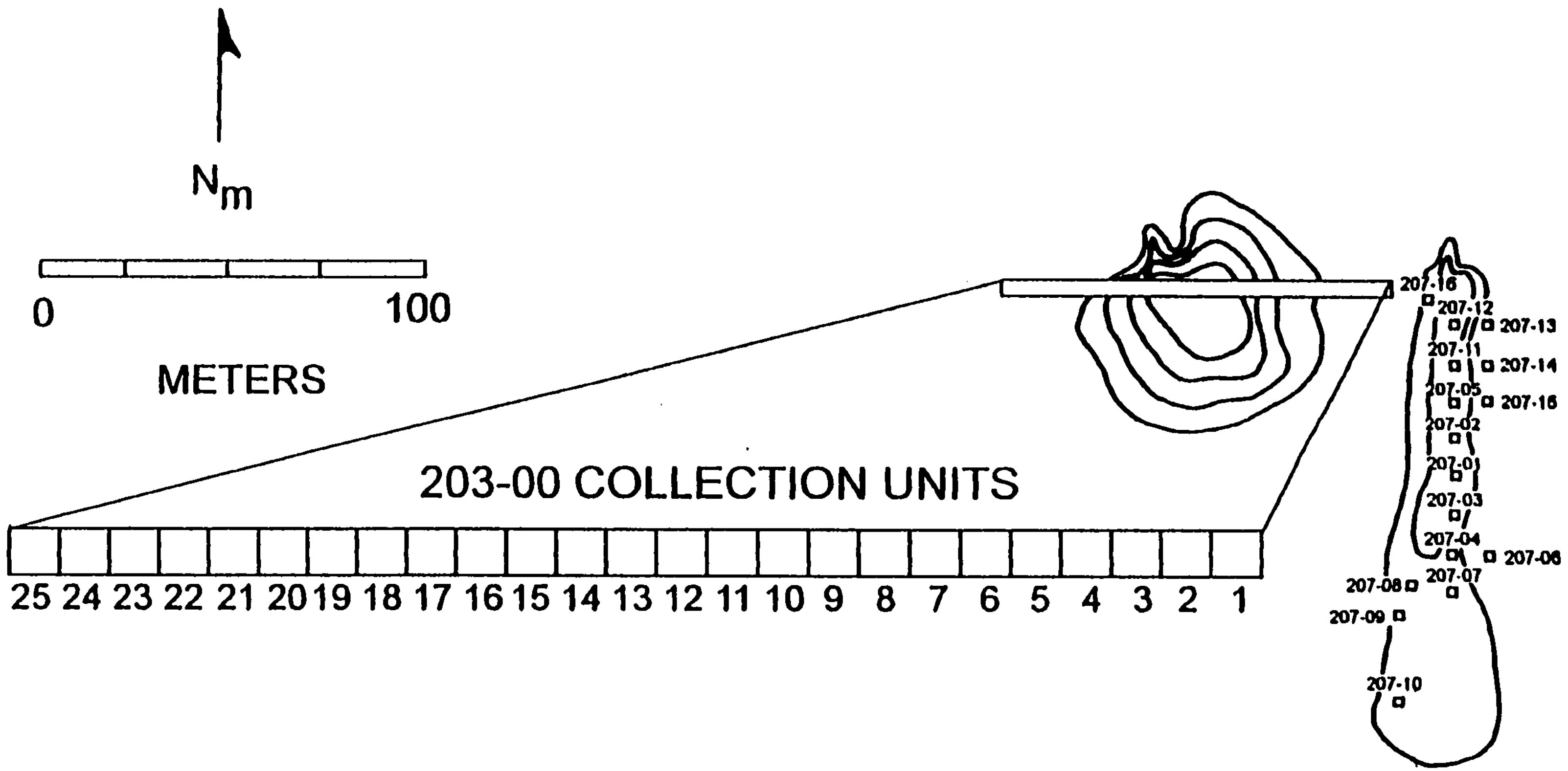


Figure 6.7. Collection units at Kaundinyapura mounds 203, 207

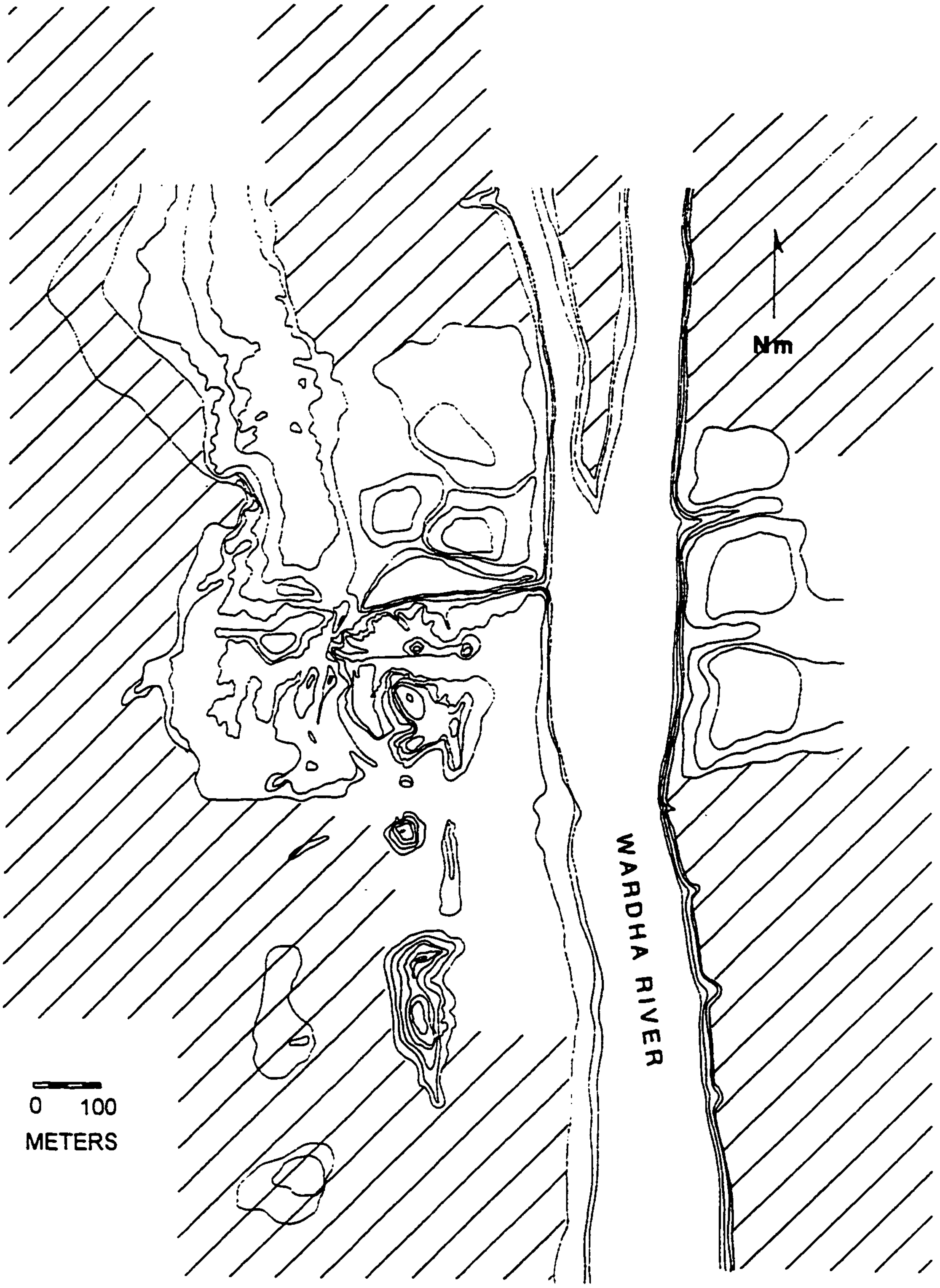


Figure 6.8. Pedestrian transect survey in the vicinity of the archaeological and modern village portions of Kaundinyapura

at intervals of 10 meters. The entire area within 100 meters of the modern village and of each archaeological mound was investigated in this fashion. Most of the fields surrounding the site were planted in cotton, with visibility of the ground being good though the plants were at waist-high level. Again, remnants of modern trash (e.g., plastic fragments, porcelain) were almost the sole artifactual remains noted in the survey zone. When premodern artifacts were noted, they twice appeared in concentrated areas which indicated the presence of underlying deposits: one locality measuring 15 x 55 meters immediately west of mound 207 (locality 302) and one locality on a promontory of the eroded headlands to the west of the modern Kaundinyapura village (locality 23).

Prior to the fieldwalking portion of this research project, the threshold for the minimal artifact densities which would be required to define a "site" were considered based on casual observations of the areas surrounding the mounds early in the first field season. Clearly, the mounded portions of Kaundinyapura constituted a single "site": the proximity of the mounds to each other and their common artifactual repertoire argued for the treatment of the mounds as a single cultural entity despite the fact that the mounds as artifact-bearing loci were sometimes physically separated from one another. For record-keeping purposes the physical separation of the mounds was reflected in numbering sequences which gave each collection

area or mound its own number. Initial observations of the area immediately surrounding the site indicated that there was an exceedingly low level of background noise in the form of ancient artifacts, so that any concentration of artifacts (arbitrarily defined as three or more artifacts in a 10-square-meter space) was to be recorded as an artifact occurrence; this recording procedure would include mapping, artifact collection and photography.

To preserve a level of objectivity, since it was always likely that a concentration of artifacts was due to post-depositional activities, areas which were defined as artifact concentrations were assigned "locality" numbers. This strategy of nomenclature allowed for the preservation of the term "site" as describing an entity indicative of activities contemporaneous with the artifacts found there.[3,4] In the Kaundinyapura survey, the number series beginning with 300 was reserved for localities immediately associated with the mounded portions of the site, and the 400 series was utilized to identify grab samples within the

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[3]Similar divisions of nomenclature have been practiced by other survey projects; for example, in the Tarragona regional survey, Keay and Millet distinguished concentrations of artifacts as "abnormal densities above background scatter", or ADABS (Keay and Millett 1991).

[4]The term "locality" as a neutral term is also found in Indian archaeological usage, such as to identify the area of excavation (e.g., IAR 1987-88). Again, the advantages of using a term such as "locality" is that it provides a sense of neutrality, so that the investigator need not interpret the archaeological phenomenon prior to the investigation of that phenomenon.

modern village of Kaundinyapura. Numbers from 1-199 were reserved for localities beyond a 200-meter radius of the mounded portions of the sites (see extensive survey results, below).

One final difficulty to be resolved was the survey of the modern village, to determine the extent to which ancient remains were to be found under the current habitations. The 1994 survey had partially addressed this question through the use of opportunistic "grab" samples taken at any places in the village where there was exposed earth (e.g. refuse pits, manure pits). These samples indicated the presence of modern pottery types which did not match the ceramics found on the southern (numbered) mounds. In 1995, we were afforded the opportunity to examine some deeper trenches associated with the expansion of the Rukmini temple complex; again, only recent ceramics were encountered.

Finally, profiles of the hillocks on which the modern village is located indicated a very thin deposit of anthropogenic soil only one to two meters in depth, indicating a relatively short-lived presence. It appears that the modern inhabitants of Kaundinyapura have consciously avoided the southernmost portions of the site. This avoidance is reflected in the use of the area to the south of the creek as a refuse zone, clearly delineating it as a "no-man's land", and also seen in their current tendency to place new constructions on the western portion of the

village though such placement offers less protection from floods than if they were located on the higher ground of the archaeological site.[5]

### Survey in the 10-kilometer radius around Kaundinyapura

In the course of specifying the research area for the Kaundinyapura project, the Archaeological Survey of India allowed the detailed investigation of the area stretching to the limit of a 10-kilometer radius around Kaundinyapura. The principal research goal for the examination of this area was the recovery of other sites contemporaneous to the mounded portions of Kaundinyapura, as well as recording the historical antecedents to modern villages. The survey procedure for this 314-square kilometer area was principally carried out in the manner of "exploration", in which all roads were traveled by jeep, and each village investigated for premodern remains. Road-based survey has also been utilized in other parts of the world where difficulty of access or other logistical constraints prompt the use of available routes. These opportunistic surveys represent "an effective approach to the difficult problem of surveying terra incognita" though the distribution of

[5]The tendency to consciously avoid living on archaeological sites is also seen at Adam, where the villagers feel that the site is haunted and thus unsuitable for human occupation (N.C. Prakash, pers. comm.; see also Nath 1989-90).

available evidence is linear rather than areal (Bower 1986). Figure 6.9 illustrates the routes taken during the course of this survey, and the areas in which artifact-collection was undertaken; the identification of the points on the map are listed in Table 6.1.

In each village of the Kaundinyapura survey zone, lanes were walked and house-walls inspected for the presence of ceramics in the mud plaster. Archaeological deposits are currently actively mined for their soils, since the presence of ash and phosphates makes them ideal for mud-construction; thus the presence of archaeological deposits in a village should be signalled by the reuse of archaeological materials in house-walls. However, the transport of archaeological debris is not unknown, so that once again the presence of ancient artifacts was not a guarantee that a village was located over the remains of an ancient occupation. Thus, the presence of artifacts was again recorded as a "locality", as noted above, with a special survey form completed for each village which produced premodern materials.

Between villages, other areas were investigated by foot, such as any high points or areas which exhibited soil color changes or indications of architecture. Areas of interest now used as fields were walked at 10-meter intervals, but again, these investigations only documented modern use in the form of a very light scatter of trash (e.g., one modern fragment every 200 square meters). In

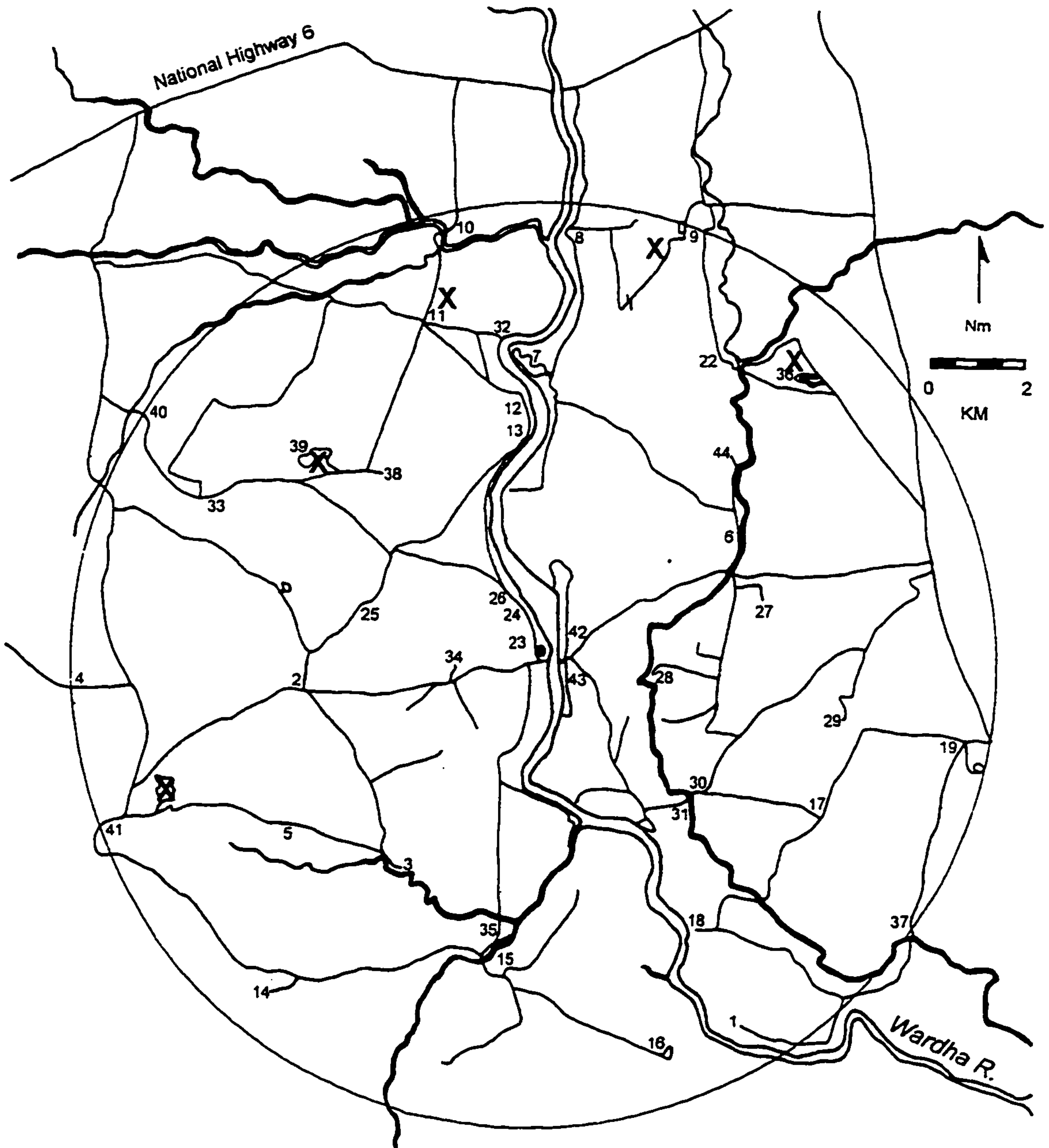


Figure 6.9. Kaundinyapura survey zone, 1994-95. Kaundinyapura is located at the center of the circle; the fine lines represent the roads traveled. Areas investigated by systematic walking at 10-15 meters spacing are indicated by an "x"

| Locality # | Modern village or other name |
| --- | --- |
| 1 | Kharoji Maharaja mandir |
| 2 | Marda |
| 3 | Borda |
| 4 | Ghota |
| 5 | Chanusta |
| 6 | Nandpur |
| 7 | Takarkheda |
| 8 | Partoda |
| 9 | Jalgaon |
| 10 | Warkhed |
| 11 | --- |
| 12 | Dhamantri |
| 13 | Dhamantri Nageswar mandir |
| 14 | Anjanvati |
| 15 | Anjansinghi |
| 16 | Pipalkuta |
| 17 | Vathoda |
| 18 | Nimboli |
| 19 | Khubgaon |
| 20 | --- |
| 21 | --- |
| 22 | Sirpur |
| 23 | --- |
| 24 | --- |
| 25 | Murtijapur |
| 26 | Ambikapur |
| 27 | --- |
| 28 | Rajapur |
| 29 | Vagda |
| 30 | Ahirwada |
| 31 | Sarkaspur |
| 32 | Umarkhed |
| 33 | Palwadi |
| 34 | Vandali |
| 35 | Alvada |
| 36 | --- |
| 37 | Neri |
| 38 | Akhatwada |
| 39 | --- |
| 40 | Bhambora |
| 41 | Kurha |
| 42 | Deurwada |
| 43 | Deurwada village |
| 44 | Yeklara |

Table 6.1. Numbered localities, and correlations with modern village names where applicable, 1994-95 Kaundinyapura area survey (see figure 6.9)

only one case was an artifact locality found which bore any resemblance to the site of Kaundinyapura, in either artifact density or artifact types. This area was located on the western banks of the Wardha river at Dhamantri, on a small mound 4 kilometers upriver from Kaundinyapura where there is now a small modern temple (figure 6.10). In 1995, the site at Dhamantri was investigated through a systematic sampling program similar to that utilized at Kaundinyapura, in which 2 x 2 and 4 x 4 meter squares were randomly placed within grid squares, and all artifacts collected (figure 6.11).

**Recovering sites from "localities"**

As noted above, all loci of concentrated artifacts in fields, and any village sites from which archaeological remains were recovered, were recorded as "localities". But which of these localities constituted "sites"? For the purposes of this research project, secondary locations of artifacts were considered to be primarily the results of postdepositional behavior (rather, for example, than the result of postdepositional natural processes), and were not further considered as representative of the cultural landscape under consideration (prehistoric occupation up to the medieval period). In later chapters, the distribution and interpretation of sites within Kaundinyapura's 10-kilometer radius will be addressed.

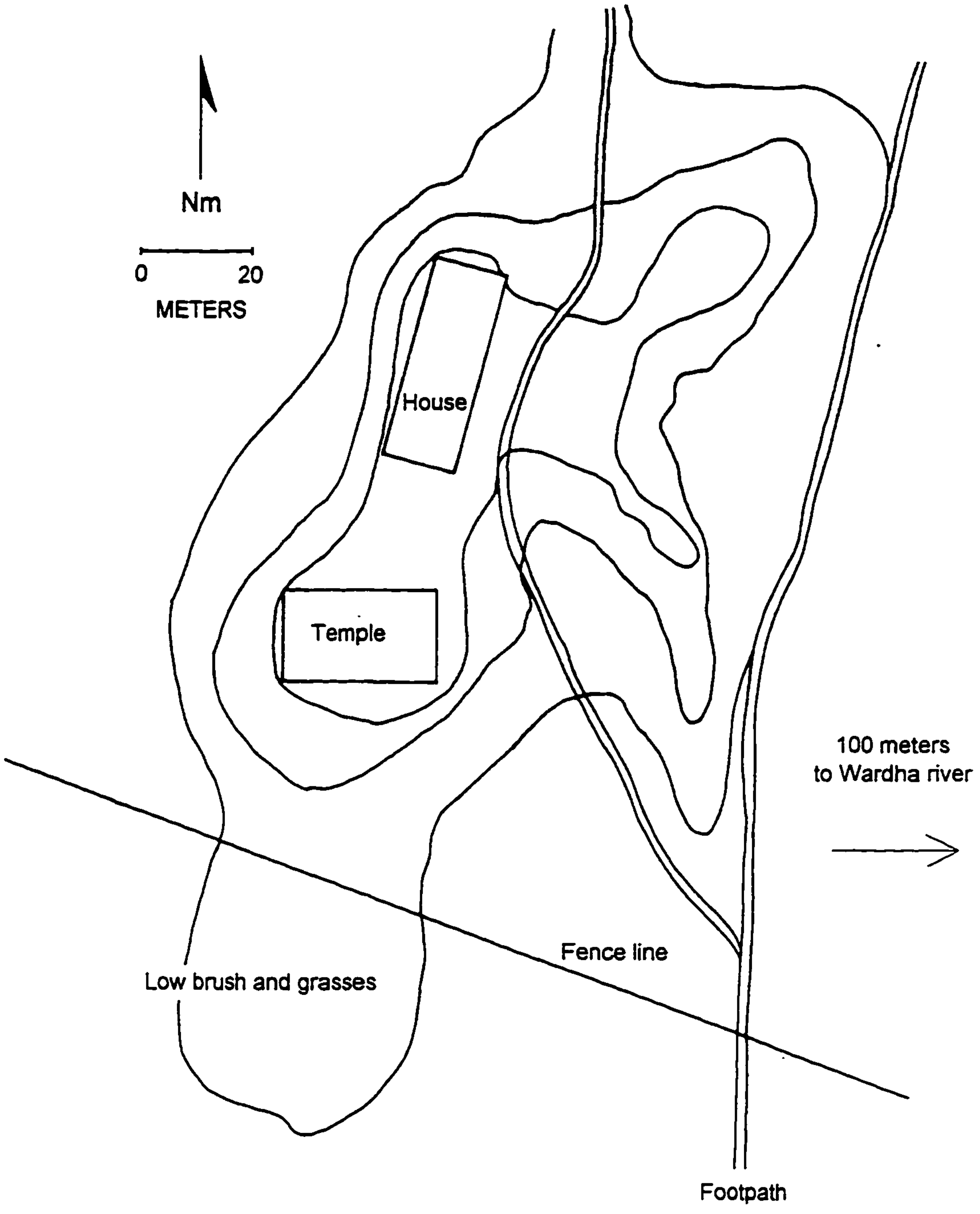


Figure 6.10. Dhamantri mound, modern uses

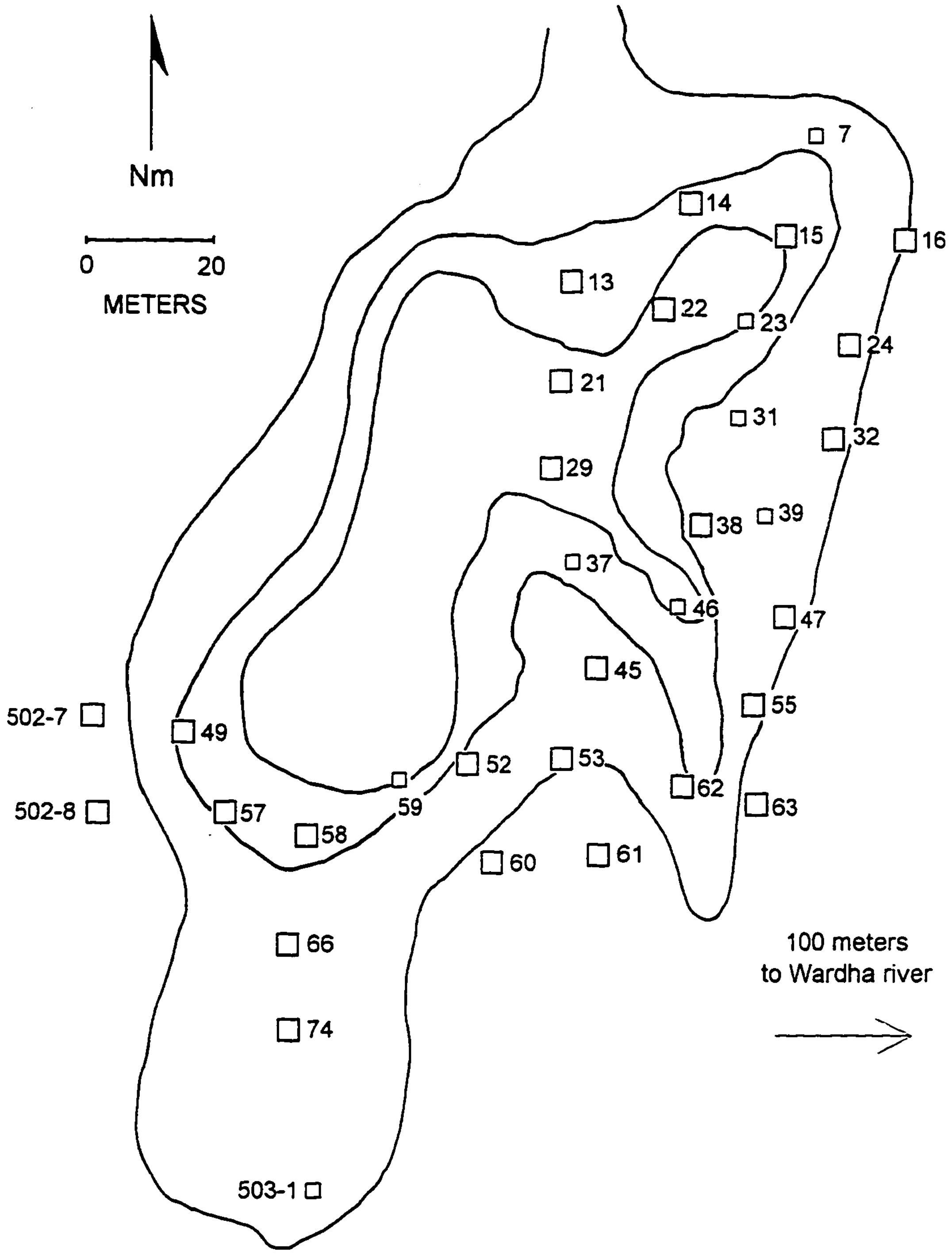


Figure 6.11. Dhamantri mound, location of sample units

## The application of archaeological survey data to economic questions

The data collection and recording strategy utilized at the sites of Kaundinyapura and Dhamantri produced a wealth of data about the consumption and production activities at the site as they are represented in both artifacts and production debris. Over 34,000 sherds were recovered for analysis, along with animal bones, freshwater and marine shell, metal fragments, slag, chert flakes, and grinding-stone fragments. In the analysis of these materials, emphasis was placed on recording attributes useful for the examination of economic activities such as the production of any surplus required for successful economic interactions. The following chapters will examine the recording strategies utilized to elicit such information, as well as the results of the data analysis.

# CHAPTER VII

## CLASSIFICATION AND THE IDENTIFICATION OF CERAMICS RECOVERED AT KAUNDINYAPURA AND DHAMANTRI

The purpose of this chapter is to discuss the ceramics of central India, and the specific typological organization of the survey ceramics from the site of Kaundinyapura. The first part of the chapter will discuss the process of classification and how the construction of typologies affects the subsequent utilization of any archaeological data set. A brief discussion of the way in which ceramics are generally identified at Indian sites shows that while these categories are useful for broad chronological assessments, finer-scaled typologies can yield more varieties of information useful for the evaluation of how different ware categories were distributed at a site, providing proxy information about economic and social differences. The second part of the chapter will discuss the way in which ceramic wares were classified for this project, with a focus on the Early Historic period wares from Kaundinyapura and Dhamantri. The classification utilized in this project was developed to examine issues of chronology as well as the diversity of ware types within broadly-defined time periods.

## Theories of classification

Classification constitutes an essential part of epistemology, where the naming of things provides a common ground for examining the relations between objects and their inferred intrinsic properties. A typology, into which individuals (whether items, events, or observations) are grouped, represents a search for structure in a data set which allows further interpretations to be constructed (Adams and Adams 1991; Dunnell 1986; Brown 1982; Gardin 1980). In practical terms, classification serves as a means of simplifying a large number of items into groups whose boundaries are formed both by the similarities between individuals within groups and the differences between individuals belonging to different groups. Because not all attributes of individuals can be simultaneously considered, some attributes necessarily take priority in the classification process.

Biological classification has often been used as the comparative exemplar for other classification systems, but biology is an exceptional field for possessing agreement on the general evolutionary principles which provide a basal paradigm for formation of groups. Genetic relations are the basis upon which individuals are grouped into the minimal unit of analysis, the species; species are afterwards related to one another according to their similarities in a hierarchically-organized tree of genetic

relations. The adherence to general evolutionary principles means that biological classification proceeds in an orderly fashion. Archaeology does not enjoy such a discipline-wide paradigm; in addition there is the difficulty that types formed of archaeological materials are both units of analysis and observation as well as carrying a potentially different meaning for the people in the past who used them (Dunnell 1986; Spaulding 1953).

With the lack of a dominant paradigm, there is little guide on how many types should be constructed from a given assemblage. One could even argue that abundance is the result of types, rather than the elucidation of types being the natural outcome of abundance. In other words, the problem-oriented classification process seeks out broadly-inclusive types so as to successfully reduce a large number of data points to a small number of categories. To achieve this, classification requires the selection of features from <u>all</u> of the discontinuities present in an assemblage; the fewer features considered, the more arbitrary the classification (Ellen 1979:8). This selection process necessarily results in outliers, or anomaly: "In as much as all classifications are of varying degrees of arbitrariness, so they have a <u>potential</u> to create anomaly continually...In this sense anomaly is ubiquitous" (Ellen 1979:14; emphasis in original). Prior to classification, all items in an assemblage are viewed as individuals; after classification, individuality is sublimated to a series of

common denominators. The fewer the denominations chosen, the larger a category will be numerically; thus the types, as well as the outliers, generated in this process are an interpretive rather than an observational phenomenon.

For the anthropologist, classification is doubly difficult, since it is both a tool for objective organization of materials and a possible indicator of the cultural behavior which is incorporated into those materials. This difficulty becomes even more complex for the archaeologist, whose understanding of the material culture palimpsest cannot be tested by returning to the culture which produced it. The introduction of cultural interpretations which are not physically carried with the artifact, and whose significance can only be assessed on the basis of analogy, means that the archaeologist deals with artifacts both as concrete objects and as potentially ambiguous symbolic carriers. Thus, the goal of classification has been to derive both an etic and potentially emic series of types; the resultant conflation of these different types has resulted in a greater emphasis on programmatic statements rather than theoretical considerations of the classification process (Dunnell 1986).

Classification in archaeology is thus a problem-oriented exercise, in that "no single correct all-purpose typology is consistently applicable to any body of data or observations" (Price 1984:216; see also Brown 1982; Hill

and Evans 1972). The assignment of priority for the attributes which can be measured on individual artifacts either explicitly or implicitly reflects the principal questions of the investigator. These questions usually follow broad current trends, and successful classification schemes are widely accepted by fellow researchers (Dunnell 1986). Shifts in investigative questions prompt shifts in classification methods, as documented in one insightful commentary on the relationship between practical typology and archaeological theory (Adams and Adams 1991).

In American archaeology, the first attempts at classification focused on chronological control, which reflected questions about cultural history (Willey and Sabloff 1980). Later, the chronological-historical approach focused on the meanings of types, and whether an archaeologist could assume that an imposed classification paralleled the types which would have been in the minds of the ancient creators of those artifacts. When questions about the archaeological record were reformulated to focus on cultural process, new classifications, mostly centered on function, were devised. In the 1960's, new "scientific" standards were sought at the same time that computerization became a practicable means of sorting, to produce a situation in which the formulation of types became the focus of study rather than the meaning of those types (Adams and Adams 1991).

Regardless of how classes are formed, they should not

be regarded as permanent entities, since further research may prompt the reconstruction of classes. Large classes may be broken down into finer-grained entities at a later stage of analysis; one example comes from the Indo-Iranian borderlands, where the ceramics known as Faiz Mohammed and Emir wares were found to have greater distinction than earlier realized:

> ...though both ceramic types are superficially similar, having black painted designs on a reduced grey ware body, recent research has clearly shown that the types are distinctive in design, shape and mineralogical composition (Lamberg-Karlovsky 1989:262).

Classification which places individuals into mutually-exclusive groups is ultimately limiting because it is afterwards impossible to separate subcategories of attributes to examine characteristics which cross-cut different classes. When a discipline lacks a unifying paradigm for classification, the ability to crosstabulate different attributes to repeatedly form new groups for analysis is particularly useful.

The formation of simultaneous analytic groups based on attributes rather than whole objects more clearly parallels the way in which objects are perceived by the people who use them. The use of objects may encompass multiple meanings, since shifts in contexts (e.g., from a domestic context to a burial context) change the meaning and usage of individual items. While the specific meanings of objects may be elusive to outsiders, the use of attributes

as a basis for analysis calls attention to dissimilar items which may have been viewed as a coherent group based on shared attributes. The attributes of objects (e.g., decoration, physical composition, size, color, shape) enables them to be grouped in different ways; for example an examination of the storage capacity of vessels may group all large forms together even though they are made of different materials, while an examination of the vessels' origins may group the same vessels differently (by inclusions, decoration or surface finish). The cataloging of attributes provides the only way to acknowledge that individuals, whether people or artifacts, are members of cross-cutting groups.

The interpretation of classification efforts should also incorporate information about how the data were gathered, as the size of groups and members per group depend not only on the total number of individuals investigated, but also upon the sizes and configurations of the initial units of investigation. For example, the low frequency of an artifact type may very well be a product of the size of the sample unit, when frequency-per-unit or presence-absence indicators are included among the attributes of a particular type. In the Keos survey, small units of investigation (agricultural fields) had tallies of artifacts which were recorded in some cases as single items of a particular class (n=1) (Cherry, Davis and Mantzourani 1991). The use of larger units of spatial analysis, which

could have been created by grouping fields together, would have increased the totals per analytical unit, but would have obscured the fine-grained units of data collection which the survey was using to determine the "trailing edge" of artifact concentrations (Cherry, Davis and Mantzourani 1991; cf. Plog, Plog and Wait 1978).

Thus while the low quantitative aspect of single exemplars may be an artificial effect of the sampling units involved, the aggregation of those units provides a picture of those single exemplars into a broader pattern while maintaining small-scale spatial integrity. After data collection, the size of the analytical unit can be adjusted to suit the particular questions asked of the data base. Successive groupings of individual items can be broadened or narrowed according to the functional, stylistic, or associational aspects of the archaeological data set being investigated.

The utility of multipurpose classifications in archaeology has been explored in both theoretical and practical terms. In examining the language-structures used by the framers of archaeological constructs, Jean-Claude Gardin has proposed that the work of archaeology be divided into two spheres: compilation and explanation (Gardin 1980). The basic stage of work would consist of a construction of charts or tables which list all measured attributes per artifact. These synthetic compilations, which could be developed and added to by all archaeo-

logists, would then serve as the basis for actual explanations of archaeological phenomena by selected, qualified individuals. Gardin assumes that a computerized cataloging system would be an appropriate means to handle large quantities of data, but he is unclear about the specifics of the way in which data will be catalogued. Since cultural materials display a wide variety of variables, it would be virtually impossible to design a cataloging system which would take "all" of these variables into account. Although Gardin is correct in assuring that the power of computerization can address a greater quantity of variables and consider them simultaneously, the process does not mean that a new kind of classification can be achieved.

Nor would the possibility of post-hoc taxonomy based on the combination of characteristics, such as numerical taxonomy, necessarily make a "better" set of functional or analytic types. "Numerical taxonomy has failed because it does not tell us anything useful or new. Experience has shown that archaeologists need little help in defining standard morphological types. Traditional analytical methods really seem to work" (Thomas 1978:236). The principal disadvantage in utilizing categories defined "by eye" by the initial classifier is the question of replication. Adams (Adams and Adams 1991) pointed out that in his study of the ceramics of the Sudan, no one was afterwards able to exactly duplicate his manner of

separating sherds. Thus, the solution here may be to record attributes in a manner in which they can be duplicated, such as with physical measurements of size or through utilizing standardized qualitative measures such as the Munsell color chart. However, since the variables to be measured must still be chosen by the investigator, every classification effort will continue to contain a subjective element (Adams and Adams 1991).

The subjective element can affect classification efforts in several ways: in the selection of the attributes to be catalogued, the selection of the sample units which contain the individuals to be sorted, and the number of groups which are to be identified from a given collection of individuals. By choosing different combinations of attributes as the basis for groups, the number of groups can increase or decrease, just as the number of individuals within groups can also increase or decrease depending on the attributes or attribute combinations which comprise the group. The rejection of classes with few individuals should be undertaken with considerable caution, since low-frequency items may be reanalyzed to join larger groups when different attributes are considered.

Charles Redman (1977), in a discussion of stylistic studies undertaken on the Cibola Project, described how he looked at design elements on rare occurrences of whole pots to help in the analysis of style on sherds. While the occurrence of whole pots was rare, by considering them as a

complete design field they could be incorporated into a broader study, the goal of which was the analysis of large quantities of sherds. Reclassification moved these items from rarity (whole pots) to abundance (design elements), which reflects their value in the assemblage for some types of analysis. Another means by which different attributes can be grouped into successive categories is Q-analysis, where each individual type or item may be classified as a subset of multiple groups, a process which allows multiple simultaneous hierarchical classifications (see Rogers 1990; Aldenderfer 1987).

The use of multiple classification more closely approximates the way in which artifacts conveyed multiple symbolic and functional roles. The comparison of domestic and mortuary contexts is an example of the way in which multiple roles can be assessed for archaeologically-known cultures. Items of domestic use, such as vessels and utensils, clearly have no further functional role for the deceased, but as symbolic indicators affirm the roles held by (or which would have been anticipated for) the person interred. In examining mortuary variability in the Klunk-Gibson mound group in the lower Illinois valley, David Braun proposed that variability reflected social dimensions of variation (Braun 1979). This social variability was not limited to a simple elite/non-elite distinction; instead, his work showed that a "dimension of differentiation among burials may consist of either a single attribute or a set

of attributes, which covary and thus cooperate in partitioning the burial population into subsets based on differences in burial treatment" (Braun 1979:67). It is important to note that because objects have many attributes, it is sometimes the similarities of attributes among different kinds of objects which constitute analyzable groups. Those attributes, rather than individual items, were the groups useful in evaluating how burials in the Klunk-Gibson mound group reflect social status.

Another practical application of a compiled classification was undertaken in the analysis of the pottery from Caesarea. The researchers began with the premise that "the problem of classification lies at the root of our inability to extract the kinds of information we believe to be contained in the ceramic portions of the archaeological record" (Bennett and Blakely 1989:7). Viewing past attempts at classification as being too heavily focused on chronology, their recording strategy began with the three types of information which can be directly observed from ceramics: the form (morphology), fabric (composition) and the findspot (stratigraphy). Fabrics were grouped utilizing the results of x-ray analysis, with group cohesion tested by heavy mineral analysis and thin sections of some sherds. All entries were recorded into a computer database which included a graphics component to incorporate drawings, photographs and

x-ray images, providing a means to inquire about different aspects of the ceramic corpus (Bennett and Blakely 1989).[1]

The examples from the Illinois valley and Caesarea indicate that the practical grouping of artifacts into types which permit further analysis is most successful when attributes, rather than individual items, are the basic element of the classification. The identification of attributes in the recording process also means that previously-acknowledged categories of information encompassed by traditional typologies are not eclipsed by a continual series of "new" types. Traditional names and the chronological aspects of previously-identified artifact classes can, however, be supplemented with new information which enables individuals to be grouped to answer a number of different questions.

## Classification as usually applied to Early Historic Indian materials

Classification of the materials found in Indian

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[1]The authors' attempts to create a "value-free" typology for their materials could only be successful to a certain extent, as their choice of the three elements of form, fabric and findspot were guided by underlying convictions about the utility of ceramic analysis. As one commentator on this work noted, Bennett and Blakely are primarily concerned with aspects which are related to trade activities (such as fabric, which is useful for discussing ceramic origins) and do not allow for the recording of other aspects of ceramic use, such as those which could be utilized to construct symbolic interpretations (Strange 1989).

archaeological sites generally focuses on chronology. For example, the ceramic wares which have received the most attention are those which are indicative of large-scale cultural contact, or which are horizon-markers associated with cultural change such as the shift to food-production. In the Early Historic period, two genres of fine ware have drawn especial attention, a group known as "Red Polished Wares" principally known from Western India (especially Gujarat) and the "Rouletted Wares" which appear primarily on the eastern coast of the subcontinent with some exemplars from Sri Lanka and the eastern littoral of the Indian Ocean.

The first extensive description and discussion of Red Polished Ware was undertaken by B. Subbarao, who described this ware as having a fine levigated clay, fired to a uniform brick-red color and having an outer surface which is polished with colors ranging from lacquer red to a dull brown (Subbarao 1953:56). Found at many sites in Gujarat, especially in Saurashtra, this ware has generally been found in strata ranging from the 1st to 5th centuries A.D., associated with both the Kshatrapas in Gujarat and the Satavahanas in western Maharashtra (Nanavati, Mehta and Chowdhary 1971; Subbarao 1953). Subbarao's characterization of this ware indicates that it occurred in a number of fairly distinct forms: a thick spout with a narrow aperture commonly known as a "sprinkler"; tall, thin necks with everted flat rims; fancy everted rims with external

grooves, and shallow saucers (figure 7.1; Subbarao 1953:58). Subsequent investigation of this ware type has increased the number of recognized forms, with Orton claiming to distinguish up to 160 stylistic variations in jar rims alone (Orton 1991:46).

While the forms of Red Polished ware have received some attention, there remains little technical description of the pottery beyond a characterization of the colors of individual pieces according to the Munsell color chart (Orton 1991). As a result, descriptions fall into a range of idiosyncratic usages depending on the investigator, with a number of derivatives of Red Polished Ware such as 'polished red ware', 'red-slipped ware', etc. On other occasions, forms similar to Red Polished Wares of Gujarat are described simply as "red polished wares" (without initial capital letters) and lack any additional or specific referents, such as the sprinklers and spouts found at Keesara, Andhra Pradesh (Sastry 1979).

Rouletted ware has been more consistently described, perhaps because it appears in only one form (a flat-bottomed bowl) and has a distinctive pattern of decoration. This form was first described in detail by Krisna Deva from the abundant finds at Arikamedu: flat-based dishes with an incurved rim, 12 inches (30 centimeters) or more in diameter, with a very well-polished surface and with a distinctive set of concentric circular bands of a tiny rouletted indentations on the interior (Krisna Deva, in

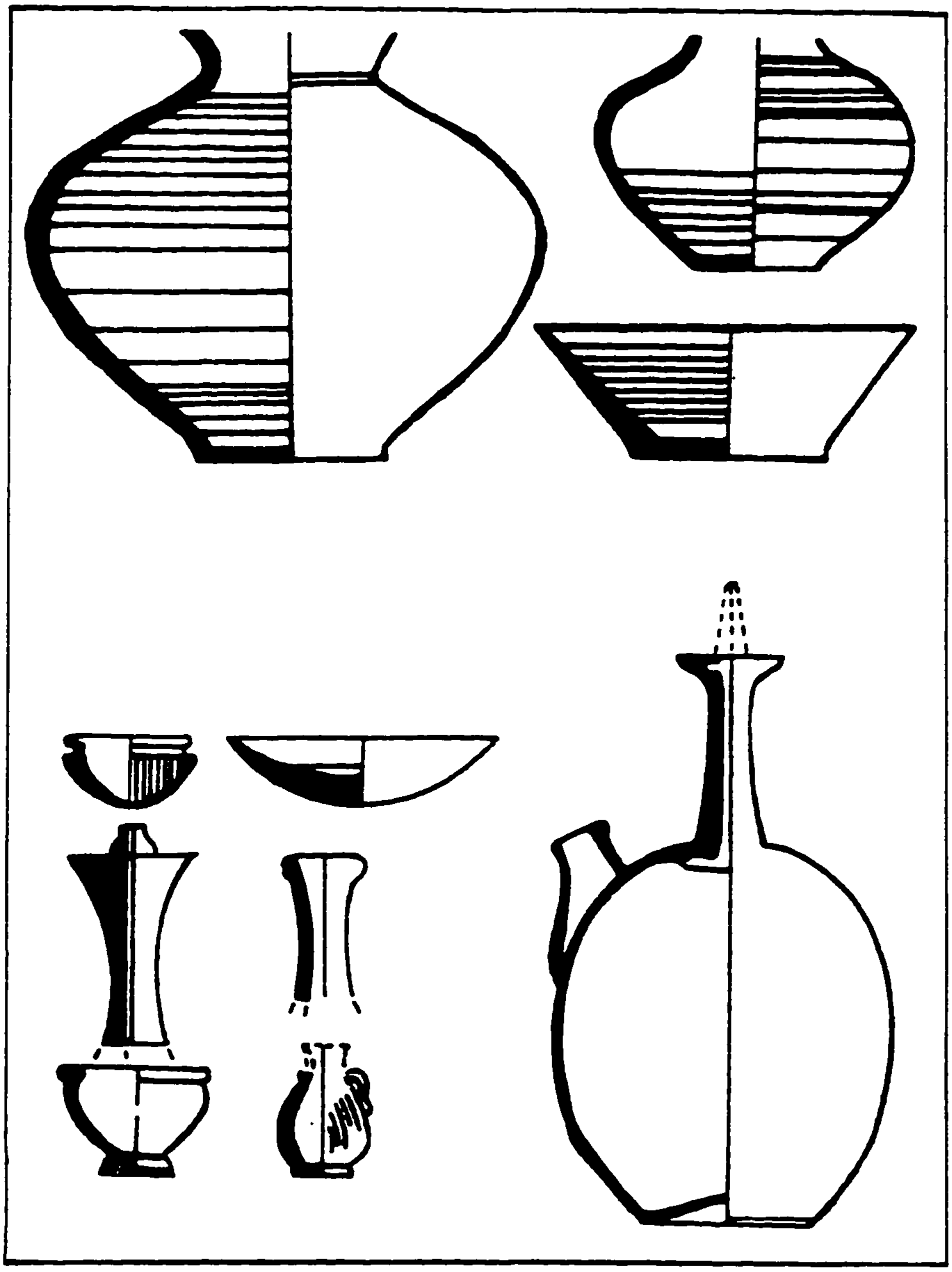

Figure 7.1. Red Polished ware forms (Liu 1988:figure 2)

Wheeler 1946:45). The ware is almost invariably gray, and unlike the various forms attested in the Red Polished Ware of the western subcontinent, appears exclusively in this flat-based dish form (Begley 1991). At the time of Wheeler's report, the rouletted design was regarded as a Mediterranean feature though the ware itself may have been locally made (Wheeler 1946).

More recent investigations have argued for a strictly indigenous Indian origin for this ware, both because there is no Mediterranean prototype for the rouletted design and because it appears to predate the importation of Mediterranean amphorae at Arikamedu (Begley 1994; Begley 1987). Rouletted ware has been recognized at Tamluk and other sites near Calcutta on the northern coast of the Bay of Bengal (Gupta 1960), throughout Tamil Nadu (e.g., Ramachandran 1980), in Sri Lanka at Anuradhapura and elsewhere (Begley 1987), and as far as Sembiran on the island of Bali (Ardika *et al.* 1993; for an additional summary of Rouletted ware occurrences, see Walker and Santoso 1977-78). As with Red Polished ware, there is rarely an explanation of the factors which prompt the investigator to identify certain sites as having "imitation" or "local-copy" versions of Rouletted ware. Nor do authors clarify why individual specimens should be characterized as "of Roman origin", as Srinivasan says of the Rouletted Wares at Sengamedu (Srinivasan 1987:23).

The two ceramic wares noted above are the most well-

known of the Early Historic ceramic types in the subcontinent, but these wares are infrequently recovered in the Vidarbha region. At Adam, 90 kilometers southeast of Nagpur, one sherd of rouletted ware from layer 3 and an unspecified quantity of Red Polished ware has been reported from the recent excavations carried out by the Archaeological Survey of India (Nath, in press). While citing the Mediterranean links of rouletted ware, the excavator declines to interpret the sherd as a direct Mediterranean import, in addition seeing the Red Polished wares as the result of local manufacture (Nath, n.d.).

Reports of explorations carried out at the Vakataka-period site at Mandhal, 75 kilometers east of Nagpur, have stated that Red Polished Ware was associated with early brick temples of the 4-5th centuries A.D. (Sharma 1992). Red polished ware was also reported from Paunar by the excavator S.B. Deo in the Vakataka levels (IAR 1966-67). To the west of Nagpur, in Buldana district, sherds and sprinkers of red polished ware of the "early historical period" were reported from Tarapur (IAR 1981-82). Excavations at Arni, 100 kilometers south of Kaundinyapura, noted the appearance of Red Polished ware in the "post-Mauryan to Satavahana" levels (IAR 1978-79). Occurrences of rouletted ware are even more rare in Vidarbha: in addition to the sherd from Adam noted above, a few sherds are reported from Arni (IAR 1978-79). However, the rarity of specialized finewares from other parts of the

subcontinent should not be surprising, given the local ability to produce fineware from available clays, and the considerable distance from Vidarbha to the coastal areas where Rouletted Ware and Red Polished wares are abundant.

Ceramic complexes which are more numerous in Vidarbha are however described in a similarly ambiguous manner. "Black-and-red" ware, which describes ceramics which are black on one side and red on the other, is manifested in a variety of qualities and sizes throughout the southern subcontinent, including central India. While the forms which are usually described as "black-and-red" ware are usually bowls, there is a range of quality from well-polished exemplars made of fine, well-levigated clay to crude bowls of coarse fabric. The description of color also varies from the identification of individual specimens which are intentionally placed in the kiln to produce an oxidized red exterior and reduced black interior; alternately, some wares described as "black-and-red" are identified as such by the presence of fireclouds or other signs of indifferent manufacture.

Ceramics described as "black-and-red" are sometimes divided into other categories by individual researchers, such as 'megalithic' black-and-red, or "coarse" black-and-red. Thus, even ware types which are recognized among researchers as appearing widely throughout a region are rarely described in a manner which allows comparison between sites through published excavation reports.

Instead, vague descriptive labels such as "black-and-red ware" serve to identify the majority of ceramics in excavation reports.[2] The identification of other wares occasionally includes a comment on the relative abundance of particular forms or an indication of the principal inclusions in the paste (e.g. straw, grit). However, the publications of excavated materials are generally aimed at giving a representation of the ceramic corpus, in which there is a drawn exemplar of each different type of form encountered within ware types broadly defined as "coarse" ware, red-slipped wares, "chocolate" wares, etc.

The vessel morphology of excavated ceramics is somewhat easier to recover from published excavation reports than a discussion of wares. Excavation reports depict what can be interpreted as a comprehensive catalog of all of the different rim forms which were encountered. Drawn exemplars are often dated with reference to other materials in the excavated strata, such as coins or architectural elements; sometimes cross-references are made to known forms from nearby sites (e.g., the Nagda report, Banerjee 1986). The more careful attention to rim forms and their general stratigraphic associations from excavation reports enables the use of surface ceramics for dating purposes,

[2]One measure of the vagueness of the label "black-and-red ware" is indicated by the use of the term to describe pottery from Nubian graves which were excavated by Indian teams during the UNESCO Aswan dam salvage project of the early 1960's (IAR 1961-62:69).

where rim forms can be linked with those from excavated sites. However, the period of interest usually stops with the Early Historic period, meaning that ceramics of the subsequent "medieval" period are considerably more difficult to date, even approximately.

The analysis of the materials collected during the Kaundinyapura project made use of the greater attention paid to rim forms for chronological control, while establishing a more refined typology for the wares themselves to enable further statements about site characteristics within chronological periods. Non-ceramic artifacts, which occurred in a smaller quantity than ceramics, were described, weighed and usually drawn; debitage and production debris such as slag was weighed and counted per collection unit.

## Analysis of ceramic wares at Kaundinyapura: the type collection

The measurement of the ceramics from the surface survey at Kaundinyapura was presented with severe limitations due to the size of the sherds recovered. Certain information, such as vessel size, could not therefore be determined from the surface materials alone. However, even the most fragmentary of archaeological ceramics present a considerable range of measurements which can be made: vessel wall thickness, temper and inclusions,

degree of fineness, manufacturing technique, degree of finishing including burnishing and slip, and decoration. The most important criteria in determining which attributes should be recorded depends largely upon the attributes which are required to address the specific research questions of a particular project. In addition, standard attributes recorded by other projects in the region should also be recorded, to assist in providing regional databases suitable for comparative purposes. As indicated above, the usual recording of Early Historic Indian ceramic types is rather vaguely defined, and the recording of vessel forms usually a particularistic catalog which applies to the site in question only.

For this study, the ceramics were defined and recorded to retrieve information relevant to the central research question of how a trading site participated in exchange networks in the absence of political cohesion. Issues of chronology, for which ceramics are often the most abundant testimony, were basic to the assessment of the growth of the site through time. Equally important was the assessment of the wealth and the distribution of wealth for the site's inhabitants utilizing the diversity and quality of ceramic wares as a proxy wealth indicator. The distribution of wealth indicators could then be compared to the distribution of trade items, to discern whether access to non-local goods was limited to certain sectors of the site. At the same time, ceramics themselves could be indicative

of contact between Kaundinyapura and other sites, if similar ceramic styles were found in nearby sites or if it could be demonstrated that the actual vessels traveled from one region to another.

As noted earlier, previous descriptions of ceramics from this area were too general to provide specific information about ceramic wares in the way in which they could be useful to this study. Thus, the entire ceramic collection was approached as if it were undifferentiated. In providing the means to address the specific questions of this project, such an approach also constituted an experiment in the classification of a previously-unsorted data set. Although there was a large number of attributes which could be recorded, it was decided that the attributes which would address the largest number of questions for this project concerned vessel form and vessel quality. The establishment of ware categories, which described the color and surface treatment of individual sherds, served as the basic means of distinguishing ceramics from one another. All sherds were typed according to wares, though diagnostic sherds (rims, bases) were subjected to additional measurements to record more specific information such as vessel form and the size of the vessel opening.

The type collection was established utilizing body sherds. Types were originally identified from the first collections in location 201, with eighty-one mutually exclusive types initially established. In this initial

sorting strategy, the purpose was simply to pick out the entire range of sherds, so the location 201 collection bags were opened and examined only with this intent. The eighty-one different sherds which were picked out from this initial step were first separated by the most distinctive attribute of appearance (usually surface treatment) and then by surface finish and thickness, to provide non-duplicating categories based on appearance. Each ware was identified for coding purposes by a number, and numbering sequences were grouped so that a quick assessment of the ware types found in any particular unit could be made without reference to a coding sheet. Table 7.1 illustrates the number groups which were established for the different wares:

| | |
|---|---|
| 100-119 | Brick and tile |
| 120-149 | Large jars |
| 150-199 | Unslipped wares |
| 200-219 | Red wares: slipped, unburnished |
| 220-259 | Red wares: slipped, burnished |
| 300-319 | Brown wares: slipped, unburnished |
| 320-359 | Brown wares: slipped, burnished |
| 350-399 | Black wares |
| 400-499 | Yellow wares |
| 500-599 | Micaceous wares |

**Table 7.1 Ware groups numbering sequence, Kaundinyapura type collection**

It should be noted that the decision to make a separate category for micaceous wares results in the potential duplication with other categories: for example,

there are micaceous wares which have slip, either on one or both sides. There are also some red and brown wares which have a small amount of mica in the paste: 1-2%, as assessed from the inspection of a fresh break under 10x magnification. There was no formal threshold for the amount of mica which resulted in a ware type being designated a micaceous ware; however, mica seemed to be distributed in two distinct groups: wares which had 1-2% mica in the paste, and wares which had at least 10% mica. Thus, there was little difficulty in making a distinction along a gradient of mica content, and the assignment of a sherd to the "micaceous" category was usually clear. In any case, the sorting criteria were based on upon factors of recognition which would result in a consistent relegation of individuals to types. Some red and brown wares were noted to contain a very low mica content in the 1-2% range. The low power of the magnification (10x) may have resulted in the misidentification of some of the inclusions, in that the refraction caused by quartzite or sand particles may have been noted as mica.

The process of creating the type collection consisting of 81 distinct types from the location 201 collections is summarized in figure 7.2. The total ceramic collection from location 201 was then compared with this type collection, with the tally of the counts and weights of each type recorded on the form for that collection unit. Only sherds which had both sides intact were considered;

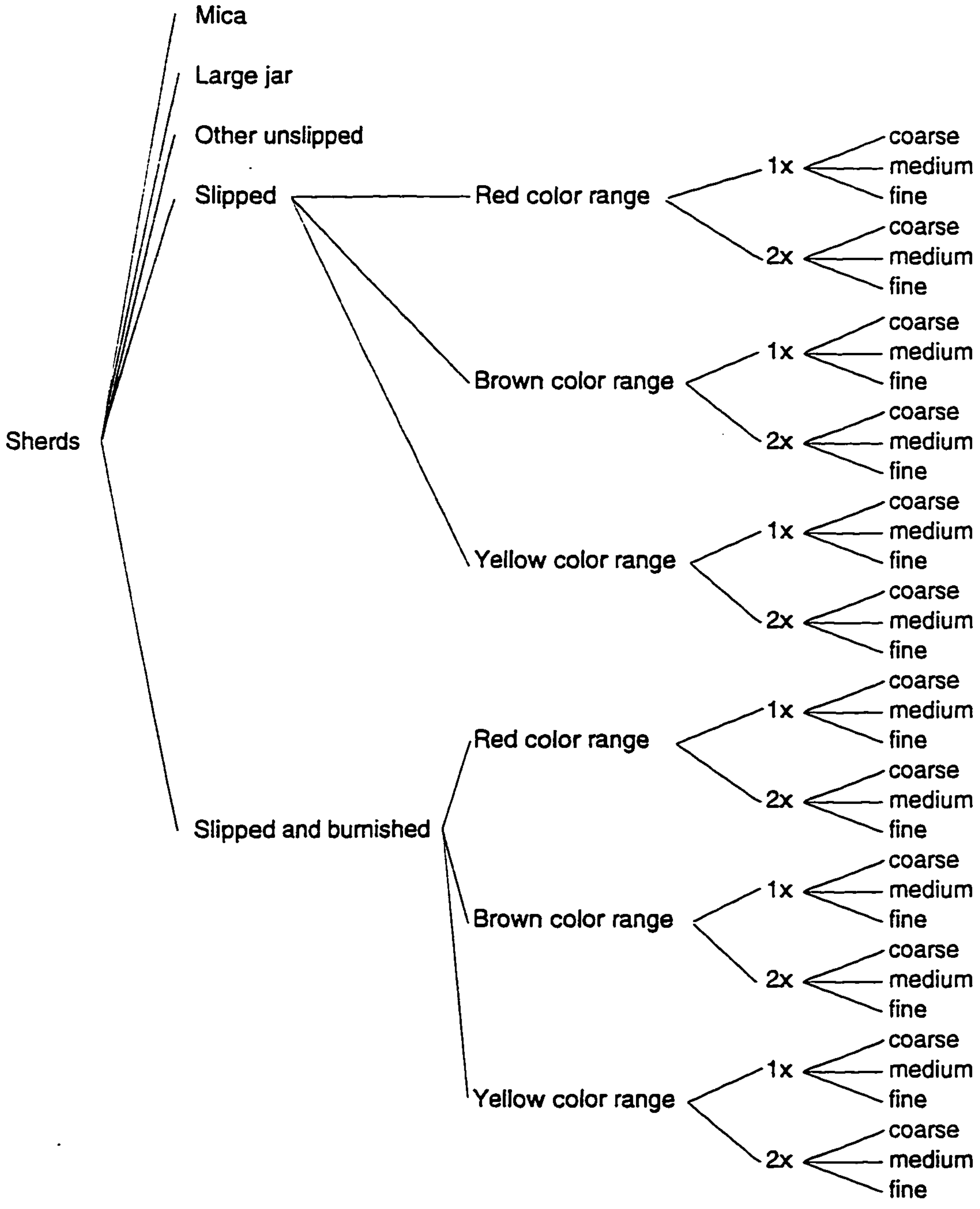


Figure 7.2. Initial sorting criteria for creating the type collection. 1x or 2x refers to whether there is surface treatment on one (1x) or both (2x) sides of the sherds. The designates of coarse, medium and fine refer to a combination of the thickness of the vessel and the fineness of the paste (in initial review of the ceramics, vessel thickness and paste fineness were almost always correlated).

sherds which were badly abraded or otherwise too damaged to assess their surface finish on both sides were assigned to a "999" or "599" (for micaceous wares) category.

The sorting strategy utilized here allows for individual sherds to possess multiple attributes, yet be assigned to mutually exclusive categories in which each type represents a unique combination of color, surface treatment, and thickness. This type of sorting, regardless of whether it matches the vessel makers' perceptions of vessel categories, is useful because it enables the creation of types which can serve as the basis for further analysis. As ware types were identified, a number of additional attributes which were not utilized as sorting criteria were recorded for the sherds which constituted the type collection: the presence of burnishing; the color of the paste; the identification of inclusions, and the percentage of each inclusion; the presence or absence of a firing-core; the estimated diameter of the vessel; and the weight of the sherd in the type collection. A summary of the information recorded for each type is found in Appendix A.

The percentage and type of inclusions was assessed to identify potential shifts in the source location of tempering agents, and with the intent of identifying vessel use. Other attributes, such as thickness and surface finish, provided a means of sorting wares in a manner which reflected vessel size and quality. While these numbers

thus indicate some physical absolutes, the recording of each attribute is associated with particular caveats. For example, vessel thickness may also vary over the course of single vessel, so that when body sherds are too small for the portion of the vessel to be identified, sherds from the thick (e.g. neck) and thin (e.g. body) of a single vessel would mistakenly be categorized as two different wares. Likewise, the divisions of ware categories into those which are unslipped, slipped on one side, and slipped on two sides may artificially divide sherds from the same vessel into different wares. It was noted that the majority of rims were slipped on both sides, which the majority of body sherds were slipped on only one side, leading to the conclusion that many vessels were only partially slipped.

It should be noted that the ceramics which were analyzed according to the type collection were exclusively those from the Kaundinyapura and Dhamantri sites. The sherds from the survey area around Kaundinyapura were very different, with both wares and forms not duplicated at Kaundinyapura. In addition, the opportunistic means of sampling in the greater survey zone probably did not recover all of the potential wares or forms, meaning that a comprehensive type collection could not reliably be constructed for those ceramics. Finally, the wares and forms were not duplicated in the site reports in the Vidarbha area, indicating that they were relatively recent and did not fall within time-frame of the principal focus

of the research. This interpretation was also supported by the lack of accumulation in many of the villages which produced such ceramics; although the lack of mounds certainly does not preclude the existence of archaeological materials, it was also unlikely that every archaeological site had been dispatched.

The use of one locality (in this case, the collections from the mound 201) as the base for the type collection invariably results in the identification of "types" which are subsequently found to be infrequently-occurring anomalies. At first, sherds from subsequent collection areas (202, 203, 204 etc.) which did not fit into one of the eighty-one established types were assigned a new number and the type collection grew by the accretion of new ware types. However, this expansion soon proved relatively unwieldy, as the type collection began to accumulate a number of "types" which were only represented by single exemplars. Afterwards, sherds which did not clearly fit into a type were separated on the form for a collection unit and described by color, surface finish, temper, thickness and vessel diameter; this would allow the recombination of untyped wares into type categories based on specific attributes. On several occasions, the same type of previously-unrecorded sherd was recorded in several units, thus substantiating that it was not simply an anomaly. In those cases, a new type was described, and where possible, all sherds previously answering to this

description were typed.

The relative success of the type collection and the consistency of the types can be measured by the ease of sorting once the types were established. Although it could be argued that the number of types were over-specialized in the first season of sorting, resulting in too many types, there were many instances where the sherds being analyzed matched the type-collection exemplar exactly, even when the distance of the units made it extremely unlikely that the sherds were actually from the same vessel. Another check on the consistency of sherd types would occur when the location 201 bags were sorted; after sorting and typing, it was often discovered that the type exemplar had come from that unit, and that in a "blind" test, pieces of what could well have been portions of the same vessel as the sherd in the type collection were assigned the same type as the type-sherd.

By the end of the 1995 season, the original 81 types had grown to 200 types representing over 34,000 sherds from the Kaundinyapura and Dhamantri collections. These 200 types are listed, with recording codes and explanatory notes, in appendix A. While each type was distinctive, were the distinctions significant in terms of the analysis to be undertaken? Initial investigations of a unstudied area are bound to produce a number of singular finds which are later realized to be part of larger trends or which are simply one-of-a-kind errors of manufacture. For ease of

analysis, it was desirable to determine whether the multiplicity of types could be consolidated to reduce duplication of peripheral attributes.

For the purposes of the analysis relating to the central themes of the research, color attributes were useful for sorting, but less interesting for addressing questions of vessel form, size and quality. The color of wares was an element which clearly graded from red to brown; Munsell numbers ascribed to sherds in these two color categories indicated that there was indeed a continuous gradation and that some Munsell numbers had been assigned to both "red" and "brown" wares. In this case, the use of fine-grained color distinctions based on individual readings of sherds against Munsell charts proved to be an unreliable one, and should be therefore regarded as a handy initial sort criterion but not one upon which final determinations of mutually-exclusive ware types can be made. Subtle shifts in color may be the result of firing irregularities; in the case of the Kaundinyapura ceramics, color shifts seen on larger sherds indicated that whole vessels were rarely of a uniform color.

It was found that 26 identified ware groups contained 5 or fewer sherds, and that 49 ware groups had 10 or fewer sherds. However, it is important to note that wares which represented few exemplars could not be excluded from further analysis merely on the grounds of infrequency in the combination of attributes, such as surface treatment,

color or thickness, which constituted different ware types. The isolation of unique exemplars amongst recovered artifacts may be due to a variety of factors and in the sorting stage it is not possible to distinguish whether anomalies are representative of more-populated groups elsewhere in time and space, or whether they represent production flaws or other errors. At Kaundinyapura, only one sherd of the distinctive high-gloss, fine-paste blackware identified as "Northern Black Polished ware" was recovered; however, this sherd was the only indicator that items from the Gangetic plain reached this portion of central India. This ware is recovered elsewhere in Vidarbha as well, but always in extremely limited quantities: one "doubtful sherd" at Pauni (IAR 1969-70); and an unspecified quantity from the site of Arni in Yeotmal district (IAR 1978-79).

## Classification of diagnostic sherds

During the laboratory phase of the project, all body sherds were divided into ware type, counted and weighed. Diagnostic sherds (rims, bases, and handles) were given considerably more analysis, with diameters taken of each rim, when the sherd was of a sufficient size to be measured. Drawings were made so that pieces could be compared with chronologically-sensitive ceramics from other sites and published reports. The recording strategy was

streamlined between field seasons; in 1994 each rim had also been subjected to the same analysis as given to each sherd of the type collection, so that for each rim there was information about slip, core, surface and core color, and temper type and percentages. This analysis was initially done to serve as a check on the various ceramic types, so that a range of variability for each type in terms of recognized temper and color could be made. However, this analysis for each rim sherd was also quite time-consuming. In 1995, the rim analysis was limited to counts, weights, type, diameter and form.

This latter category was the most important aspect of the rim analysis. Rim forms should generally inform on local chronology; excavated materials, including those from the 1962 and 1964 excavations at Kaundinyapura, indicated that the passage of time was mirrored by changes in ceramic morphology. Because this project recovered surface materials, with little anticipation of recovering whole vessels, morphological study was largely limited to rims. However, as noted above, there is currently no fine-scale chronology available for Indian sites of the Early Historic period, nor is there information about the frequency of the different vessel forms encountered. During the course of this project, the morphology of rims was recorded with as great an attention to detail as possible in the anticipation of recovering any shifts in ceramic style.

One means of discerning ceramic style is through the

use of rim form and vessel size and shape. There is not a strict linear correlation between these variables, since some large vessels may have quite small openings, but a comparison with excavated exemplars was expected to provide information about vessel size from known rim forms. It was also desirable to identify the number of different rim forms per sample unit, which would indicate the parts of the site which had a greater diversity of vessel forms or areas which seemed to serve a special purpose. During the recording process, each rim was examined and either drawn anew or matched to a previous drawing. For the 1331 rims whose shape could be ascertained, a total of 506 drawings were made.

The next level of grouping, undertaken when all of the materials had been described and typed, was achieved by physically matching up different drawings and putting them in groups when they were exactly the same: in size, in rim finial shape (bulbous, flattened, square, triangular, plain) and in aspect (everted, upright, inverted, incurved). Categories were also made to isolate rims which were completely abraded and fragmentary (7% of the rims) as well as for general categories, such as 'plain, incurved, not further specified.' A total of 291 groups of rims were thus consolidated from the original 506 drawings of rims from the Kaundinyapura and Dhamantri rims.

To achieve these groups from the Kaundinyapura and Dhamantri materials, two levels of consolidation had

already taken place. First, in the laboratory, each rim was scrutinized to see if it exactly matched the form of a known, drawn exemplar; secondly, once all of the drawings were collated, each drawing was matched to similar drawings and grouped together. This produced a total of 291 groups; however, nearly half (n=145) of these "groups" represented only a single record, and a mere 28 forms accounted for 75% of the rims which were intact enough to recognize their forms. The minute differences seen in the laboratory were probably a reflection of the way in which handmade vessels vary. This variance has been noted by other scholars working with potters directly, where individual vessels in the same style are slightly different from potter to potter (Longacre, Kvamme and Kobayashi, 1988).

While such differences are negligible in the terms of a vessel's specified use, they may be invested with social meaning although that meaning may be perceived by only some of the members of a culture. This selective perception was documented among the Kalinga people of the Philippines, where women could distinguish subtle variations in pots although men could not (Longacre, 1991). Among the Kaundinyapura survey ceramics, even the "exact match" techniques utilized while analyzing the rims were a means of separating what must essentially be a continuum between exemplars. These handmade vessels each incorporated minute shifts in morphology, and the way in which they were constructed could certainly mean that the same pot, when

broken, might be classified into a number of different "forms". An additional factor which multiplied the number of rim forms was the observation that some rim forms were more complete than others. Clearly, some of the identified fragmentary rim forms are duplicates of more complete forms. The survival of only a portion of the rim meant that the form could belong to more than one vessel form; straight rims broken below the flange are shown in appendix B (e.g. 53-08, 42-05, 5-06). Without the carination below the flange, it is impossible to project the length of the flange; to keep categories with potential chronological significance unobscured by these fragments, the fragments themselves were grouped. In this example, the straight rim forms of unknown flange length were classified only by thickness: thick (86-01), medium (84-13) and thin (46-01) (for these drawings, see appendix B).

Because the search for meaningful patterning must be undertaken at the group level rather than the individual level, the rims were placed into successively larger groups. A third consolidation was undertaken by examining the groups to see where similar forms could be consolidated into larger groups, where a similarity of both shape <u>and</u> diameter was required before any rims were grouped together. In choosing vessel size as the criterion which would permit similar-looking rims to be grouped for further analysis, an objective criterion was added to a consolidation procedure which contained a significant

subjective element, in that rims were now grouped by their _apparent_ similarity according to a single individual (me). The choice of the objective criterion of diameter, rather than color, thickness or inclusions, was guided by the intention of utilizing the resultant ceramic groupings to discuss the distribution of vessel forms throughout the site, to identify areas where there were any concentrations of vessel forms. Such concentrations could be interpreted as special-use areas, the nature of which might be revealed in the prevalent vessel form.

The distribution of vessel forms might also indicate whether there were social distinctions in the various areas of the site. For example, elite households, usually associated with a greater number of dependents, tend to have a larger number of serving and cooking vessels as well as maintaining food storage on a larger scale. At the same time, these households are socially-sanctioned to undertake a greater share of ritual activity; where this activity is accompanied by feasting, such households will tend to have more large serving vessels (a relationship noted in highland Peru by LeCount 1991). The effects of trampling or erosion may inflate or deflate estimates of quantity from surface ceramics; in addition, as noted in the previous chapter [check to be sure that this is the case**], surface ceramics indicate general patterns of material consumption on a site and should not be utilized to make fine-scaled estimates of individual household

activities.

Site-wide, however, there should be an indication of areas which present a larger diversity of ceramic types and those areas which present a greater proportion of large vessel forms or any other concentrations of vessel forms. The recording of diameters for individual rims in the laboratory was undertaken to discern whether some vessel forms were manufactured in various diameters. Thus the third level of consolidation was accomplished both by a subjective assessment of similarity in form as the first criterion, and diameter compatibility as the second criterion.

In sum, the grouping procedures undertaken for the ceramic collections of the Kaundinyapura survey contained both a descriptive and an analytic component. The information recorded for all ceramics, both body sherds and diagnostic sherds, was based in quantifiable attributes such as thickness, color, inclusions, and surface treatment. The isolation of these attributes for the construction of the type collection enabled the consistent and efficient sorting of materials from the collection units. The subsequent groupings of the ceramics were made based on the ultimate goals of the project: the investigation of the way in which a town site participated in trade networks, and the way in which trade goods were distributed at such a site. For example, rims were recorded with the same basic information as body sherds,

but for the purposes of this study, subsequent groupings were achieved by emphasizing two particular aspects, namely, rim form and rim diameter.

The use of a basic set of data, from which other investigators could formulate new groups of wares or forms, is similar to that proposed by Gardin. However, as can be seen from the critique of Bennett's and Blakely's classification of the ceramics from Caesarea, all classifications have some bias, in that the attributes to be recorded are chosen by the investigator. While such choices do constrain the further questions which may be put to the database, they also inform upon the specific research goals at hand and provide an expedient means of tabulating information from a potentially limitless quantity of measurements.

## CHAPTER VIII

## CERAMICS AND OTHER LOCALLY-TRADED ITEMS AT KAUNDINYAPURA AND THE CONTEMPORARY SETTLEMENT AT DHAMANTRI

In this chapter, the distribution of the different types of goods found archaeologically at Kaundinyapura and Dhamantri will be discussed. The materials recovered from the systematic surface surveys will be compared with excavated materials from other nearby sites as well as from the published excavation report of the 1962 and 1964 Kaundinyapura excavations. This comparison will first be undertaken to illustrate that for the purposes of subsequent analysis, Kaundinyapura and Dhamantri may be treated as single-period sites. Within this broad chronological grouping, the distribution of various types of ceramics as well as of other goods will be examined.

### Chronology and the material culture of the Vidarbha region

The chronology for archaeological sites of the Vidarbha region has been established through both absolute and relative means of dating. Absolute dates, such as those provided through radiocarbon (C14) dating techniques,

are relatively rare, and there is only one C14 date for any early historic occupation in the area (140 ± 120 B.C. from Khairwada, reported in Mohanty and Joshi 1996:165). The majority of the dates proposed in excavation reports are based upon estimates of the time represented by the accumulation of debris, by association with materials such as coins which can sometimes be dated to a specific era or ruler, and by the comparison of excavated materials with other sites in the region.

Groups of cultural assemblages, as noted in the published reports of excavated sites, are the markers which enable the placement of site occupations into broad chronological periods. In each of these groups of co-occurring classes which mark a chronological period, there are some highly-distinctive artifacts which serve as horizon-markers. To make a chronological assessment of the surface materials recorded by this survey project, materials from Kaundinyapura were compared with materials from other sites in the region as noted in published excavation reports.

The chalcolithic period in Vidarbha is marked by the absence of iron, and the presence of a distinctive ceramic corpus. Painted wares are a hallmark of the chalcolithic and early megalithic period in the Vidarbha region (Dikshit 1968). At Tuljapur Garhi, a chalcolithic site 65 kilometers northwest of Kaundinyapura, artifacts from both the Jorwe and Malwa phases (dated from the late 2nd mill.

to 1st mill. B.C.) include pottery with painted designs (Thomas 1992b). At Paunar, located 70 kilometers southeast of Kaundinyapura, the excavators noted that the ceramics from Period I deposits consisted of approximately 20% painted black-on-red ware (Deo and Dhavalikar 1968). In Period IIA at the same site (dated 4th/3rd century B.C. to the first century B.C.), painted ware was totally absent. Painted wares are extremely rare amongst the collection from this project at Kaundinyapura collections; only 6 painted wares were recovered from the 34,000 sherds of the systematic survey and surface collection. This supports the interpretation that the materials from the surface of the site do not represent very early periods but instead at least all postdate the chalcolithic.

The following period, which can also be examined for comparison with the Kaundinyapura materials, is the megalithic period. In general, the megalithic occupations of Vidarbha are difficult to date, but a few C14 dates are available for the area which generally bracket the megaliths themselves to 500-700 B.C., and the associated megalithic habitation areas to 800-300 B.C. (figure 8.1). Artifacts of this phase are reported to be present in significant quantities at Kaundinyapura in the excavation report by M.G. Dikshit (Dikshit 1968). But the attributes which distinguish the megalithic from subsequent phases are difficult to isolate. The gradations of what is perceived as "megalithic" pottery appears to be predicated on the

| Sl. No. | Name of Site | Locality | (Habitation/Burial) | | $^{14}C$ Dates | |
|---|---|---|---|---|---|---|
| 1 | Naikund | Habitation | Mound I | Layer (6) | BS 234 | 520 ± 100 BC |
| | | | Mound II | Layer (4) | BS 265 | 690 ± 110 BC |
| | | | | Layer (5) | BS 243 | 370 ± 120 BC |
| | | | | Layer (6) | BS 231 | 520 ± 90 BC |
| | | | | Layer (8) | BS 230 | 410 ± 100 BC |
| | | Burials | Megalith 7 | | BS 92 | 505 ± 100 BC |
| | | | Megalith 7 | | BS 93 | 545 ± 105 BC |
| 2 | Takalghat | Habitation | Mid-phase | | TF 783 | 615 ± 105 BC |
| | | | Mid-phase | | | 555 ± 100 BC |
| 3 | Khairwada | Habitation | End phase of Megalithic occupation | | BS 394 | 510 ± 100 BC |
| | | | End phase of Megalithic occupation | | BS 393 | 420 ± 100 BC |
| | | | End of early historical habitation | | BS 392 | 140 ± 120 BC |
| 4 | Bhagimohari | Habitation | Mound I : | Layer (9) | BS 536 | 750 ± 100 BC |
| | | | : | Layer (9) | BS 537 | 690 ± 100 BC |
| | | | : | Layer (8) | BS 538 | 600 ± 100 BC |
| | | | : | Layer (7) | BS 539 | 450 ± 90 BC |
| | | | : | Layer (6) | BS 540 | 500 ± 100 BC |
| | | | : | Layer (4) | BS 541 | 490 ± 100 BC |
| | | | : | Layer (2) | BS 579 | 570 ± 100 BC |

Figure 8.1. C14 dates for the megalithic sites of Vidarbha (summarized in Mohanty and Walimbe 1996:165)

assumption that "megalithic" activities are distinct from, and must predate, "Early Historic" activities.

It is clear that the artifacts from the two periods do not provide a straightforward means of separating the "megalithic" from the "Early Historic", since the same types of goods often appear in both types of sites. Examples include the megalithic "black-and-red" ware was found near the Buddhist stupa at Adurru and at Gudimel-lanka, in the East Godavari district of Andhra Pradesh (IAR 1962-63:65), and the Black-and-red ware recovered assoc-iated with the Buddhist remains at Guntupalli in the West Godavari district of Andhra Pradesh (IAR 1961-62:97) and at Lingarajupalem in the Visakhapatnam district of Andhra Pradesh (IAR 1959-60:67). The upper terminus of "mega-lithic" black-and-red ware may be well into the first millennium A.D., with such materials reportedly associated with the Akkanna-Madanna caves of the 6th century A.D. at Vijayawada (IAR 1962-63:67).

Again, one principal source of this dilemma is the lack of consistency with which labels such as "black-and-red" ware are assigned. Only when descriptions of wares are consistent will it be possible to isolate variants within ware categories based on shape, thickness, inclu-sions and surface treatment. If it is found that the same wares do continue throughout a long time span, one way to extract chronological information may be to examine the frequencies of the same wares over time, where the

abundance or scarcity of wares rather than alterations in form are the signal of chronological change. Such data may be forthcoming from new excavations with an emphasis on the quantification of all ware types, though the data are not at present available. Another means of eliciting chronological information from similar-looking wares or forms may be in the examination of inclusions or manufacturing technique. Some of the simple forms which appear in many levels of deeply-stratified sites do appear to be made of distinctly different materials. One example is from the site of site of Paunar, where a simple bulbous rim form (see Appendix B form 6-01) occurs in period I in black burnished ware and in period IIB as a red-slipped ware (Deo and Dhavalikar 1968).

### The chronology of "black-and-red" ware

As explained in the previous chapter, the term "black-and-red" ware is utilized widely throughout the excavation reports of the subcontinent, although there is no standardized definition of the ware and in practice the label is used somewhat indiscriminately. At the same time, there is among the survey materials from Kaundinyapura a particular type of fineware which often is fired under partially-oxidized, partially reduced conditions to produce a ware which is black on one side, and red on the other. For the sake of simplicity, these wares will be referred to

in this document as black-and-red wares (specifically, the 400 series as well as 352 and 355, representing fine black bowl rims which correspond in paste and fabric to the 400 series; see Appendix A and figure 8.2).

In excavation reports in which "black-and-red" wares as a general ware category have been discussed, the suggestion has been raised that the thickness of the ware increases with time; thus, "thin" black-and-red ware is early, and "thick" black-and-red ware is later (e.g. at Paunar, Deo and Dhavalikar 1968; see also the reports for Bhagi Mahairu (Bhagimohari), IAR 1982-83; Khairwada, IAR 1981-82:52). This general trend was not quantified at these sites, among which Paunar and Khairwada are the two largest excavated sites in proximity to Kaundinyapura (see figure 5.6).

In the collection and analysis of the ceramics from Kaundinyapura, one goal was the assessment of the distribution of different sizes of vessels over the course of the site, where any concentration of vessel forms could be used in correlation with other evidence to suggest special-purpose areas. The collection of this data also permits the evaluation of the proposal that there may be chronological divisions between thinner and thicker versions of the black-and-red fineware. Such a demonstration has two logical constructs: the demonstration of variable thickness in the same ware, and the projection of chronological significance on any perceived distinction.

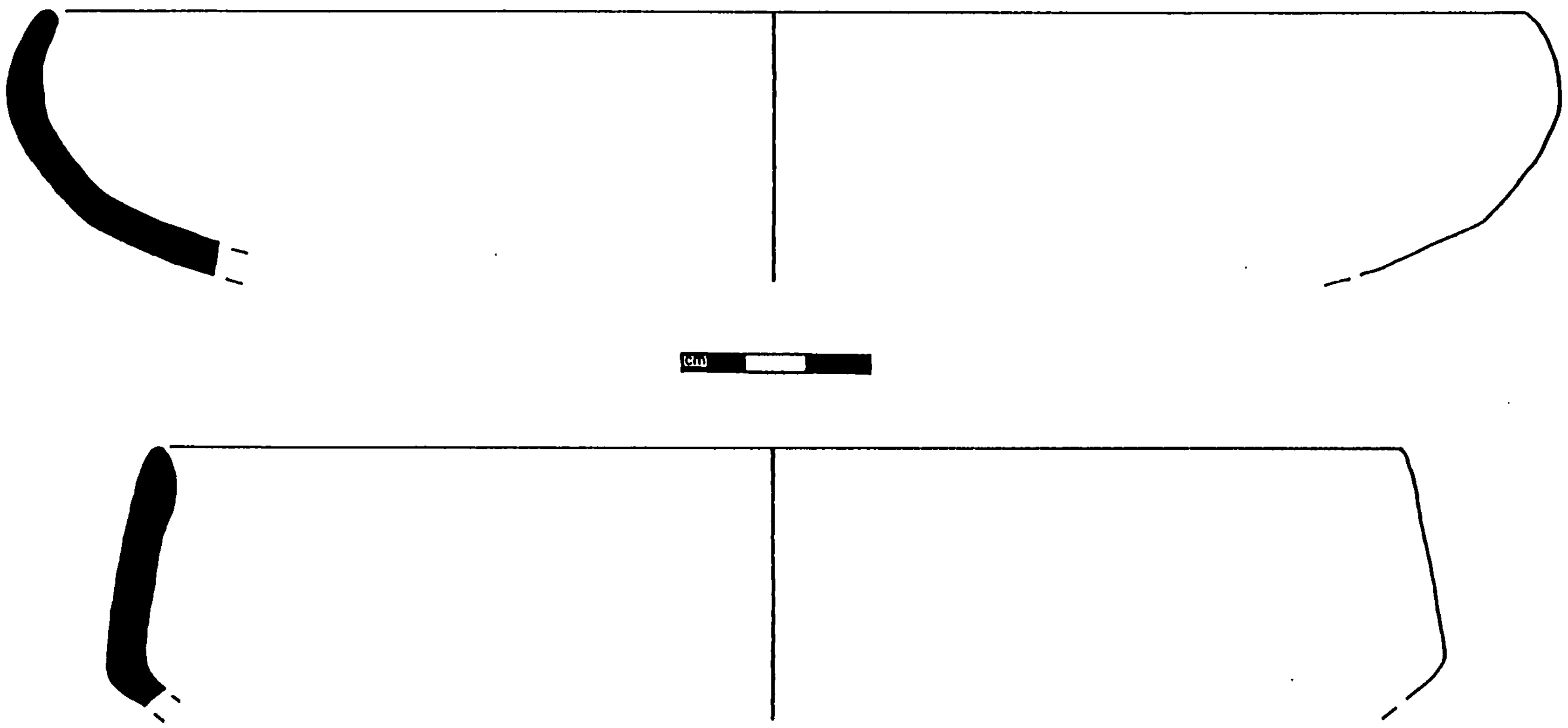


Figure 8.2. Black-and-red bowl forms, Kaundinyapura and Dhamantri

The following figures illustrate the range of body thicknesses evident in the 4,944 sherds of the fine-paste "black-and-red" ware collected from the sites of Kaundinyapura and Dhamantri. To arrive at these totals, the information on body thickness was obtained from the type collection information for the sherds of type 352, 355, and 400-422 (see Appendix A). The thickness of each type was then extrapolated to each sherd within the ware type (it should be recalled that thickness was one of the sorting criteria for the sherds from the sample collection units).

The distribution of body-thickness frequencies for all Kaundinyapura and Dhamantri sherds is shown in figure 8.3. The figure indicates that there is a wide range of body thickness in this ware, ranging from 3.3 millimeters to 8.4 millimeters. All of the sherds of this ware otherwise have no distinction in material composition, fineness of paste, or surface treatment, although they do vary in color from pale yellow to red-orange. Although the majority of the sherds are clustered at the low thickness range (3.5 millimeters), there are also distinct breaks between subsequent size categories. For example, there are no sherds whose body thickness measures between 3.9 mm and 4.2 mm and this apparent break was utilized as the provisional working division between "thin" and "thick" wares.

The distribution of sherds of "thin" and "thick" wares was then plotted on the site map of Kaundinyapura. Figure

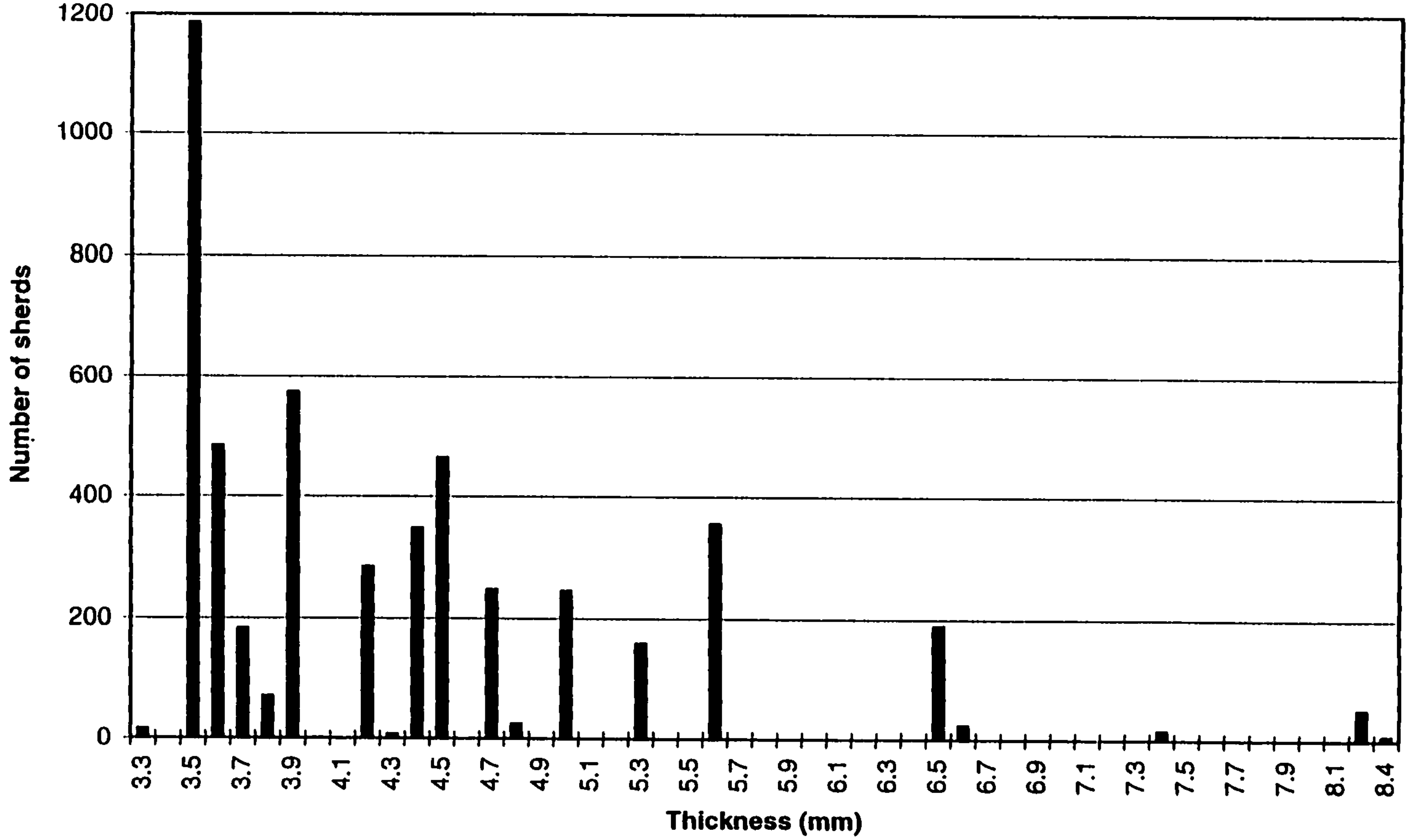


Figure 8.3. Thickness of "black-and-red" ware sherds, Kaundinyapura and Dhamantri

8.4 illustrates the distribution of "thin" (3.9 mm and less) versions of the fineware at Kaundinyapura, utilizing a standard measure of the number of sherds per square meter. The wares are at their highest density along the edges of location 201/202, the edges of the southernmost mound (locations 204 and 208), and on the top of the high narrow ridge of location 207.

In figure 8.5, the distribution of the density of "thick" (4.1 mm and greater) sherds offers some contrast, in that the overall density of such sherds is higher in location 201/202, and lower on the southernmost mound (locations 204 and 208). From this representation of the data, one might want to argue that the occupation of the site moved northward over time, with the southernmost mound being occupied earlier and the northernmost portions of the archaeological site occupied later in the sequence. Such an interpretation would also coincide with the observation that subsequent occupation zone has continued to move northwards, resulting in the present location of the modern village of Kaundinyapura to the north of the archaeological mound.

Supporting evidence for this interpretation is found in the analysis of the materials from locations 204-32 and 204-33, two large opportunistic samples from the southernmost mound. As these samples were collected from the surface of an area of clandestine digging which had resulted in a fresh exposure, the correlations between the

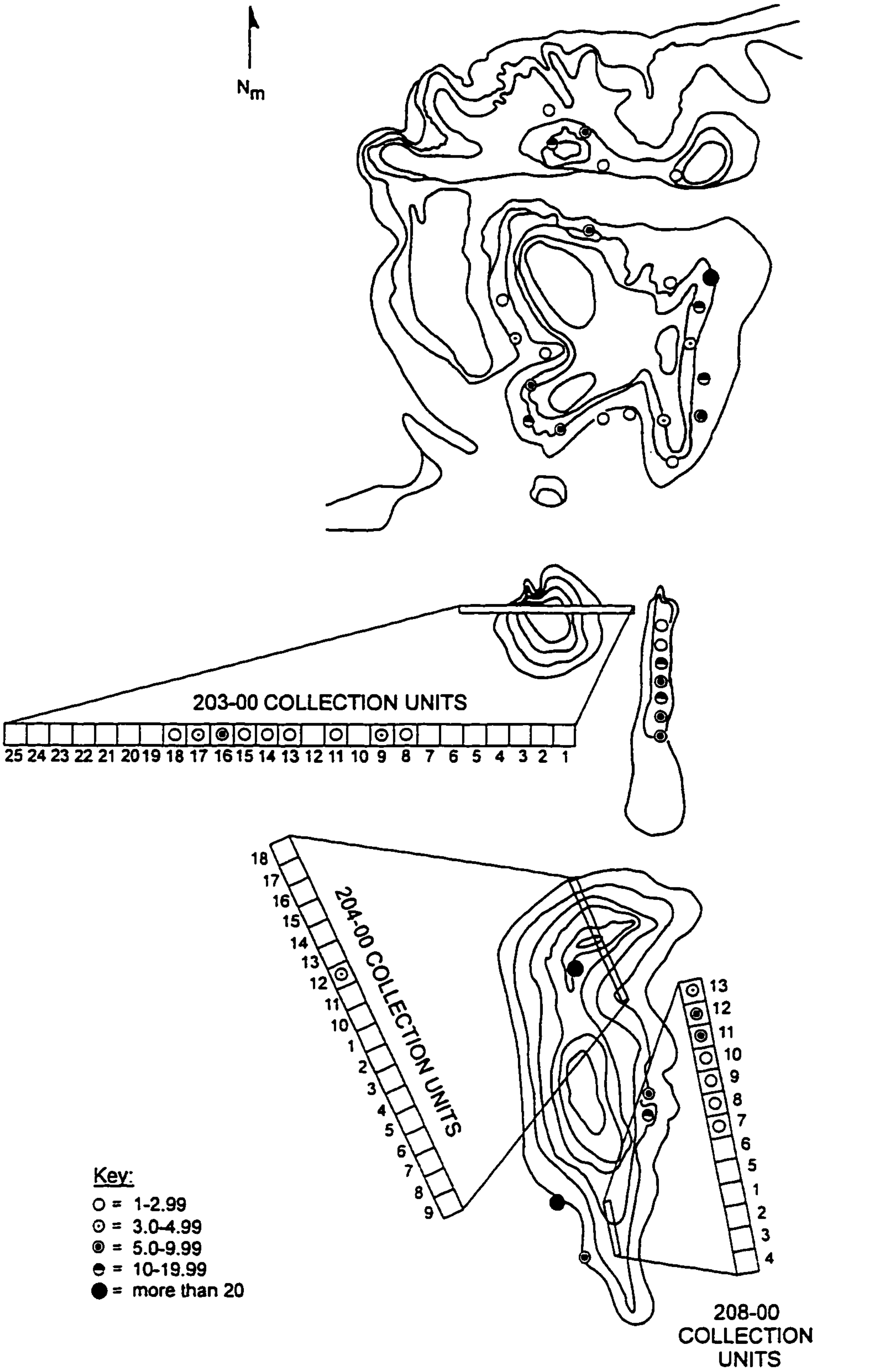


Figure 8.4. Distribution of "thin" (body thickness of 3.9 mm or less) high-polish black-and-red ware sherds at Kaundinyapura, in sherds per square meter

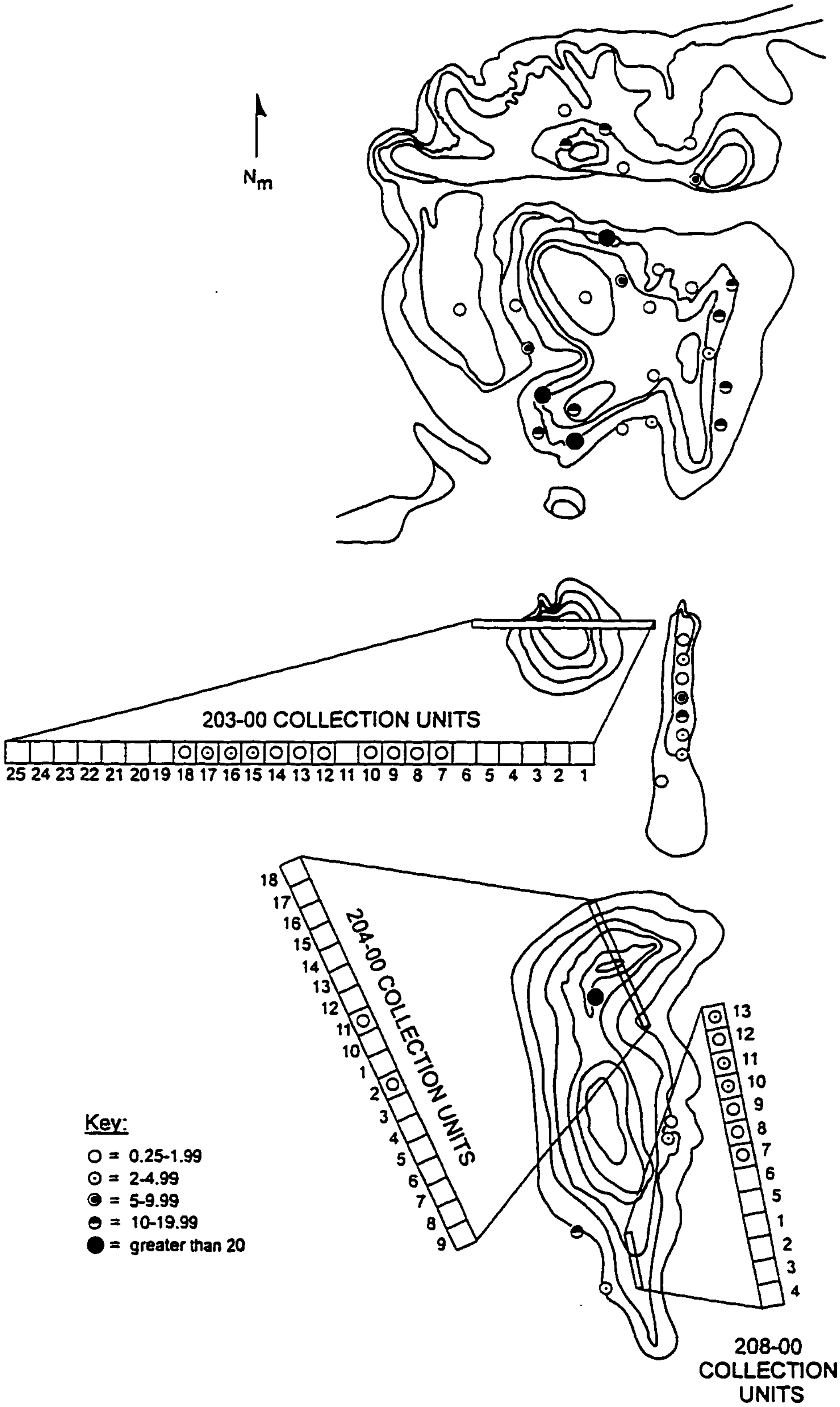


Figure 8.5. Distribution of "thick" (body thickness of 4.2 mm or greater) high-polish black-and-red ware sherds at Kaundinyapura, in sherds per square meter

artifacts collected are perhaps a more chronologically coherent unit than surface materials. The two units produced a very large quantity of "thin" ware: n=5.6 sherds per square meter for 204-32, n=15.4 sherds per square meter for 204-33. The amount of "thick" ware was considerably less: n=1 sherd per square meter for 204-32, and n=3 sherds per square meter for 204-33.

It should be cautioned however that these limited indications of a distributional difference between "thin" and "thick" versions of the highly-polished fineware may arise from a number of different causes. Distributions such as those shown here are perhaps only the result of differences in use; even the differences in density in the two samples from the fresh exposure in 204 are difficult to interpret since the stratigraphic relation of the materials in each earth-robbers' exposure is unknown. Moreover, the suggestion of chronological differences for this time period, given the above-mentioned difficulties of separating the megalithic cultural assemblage from the Early Historic one, should not be based upon a single artifact type.

The distribution of "thin" and "thick" black-and-red ware at Dhamantri indicates that this site also contains exemplars of both thickness groups (figures 8.6, 8.7). Again, it is difficult to interpret the significance of the distribution of the different thicknesses. The presence of both types at Dhamantri, and the fact that they are

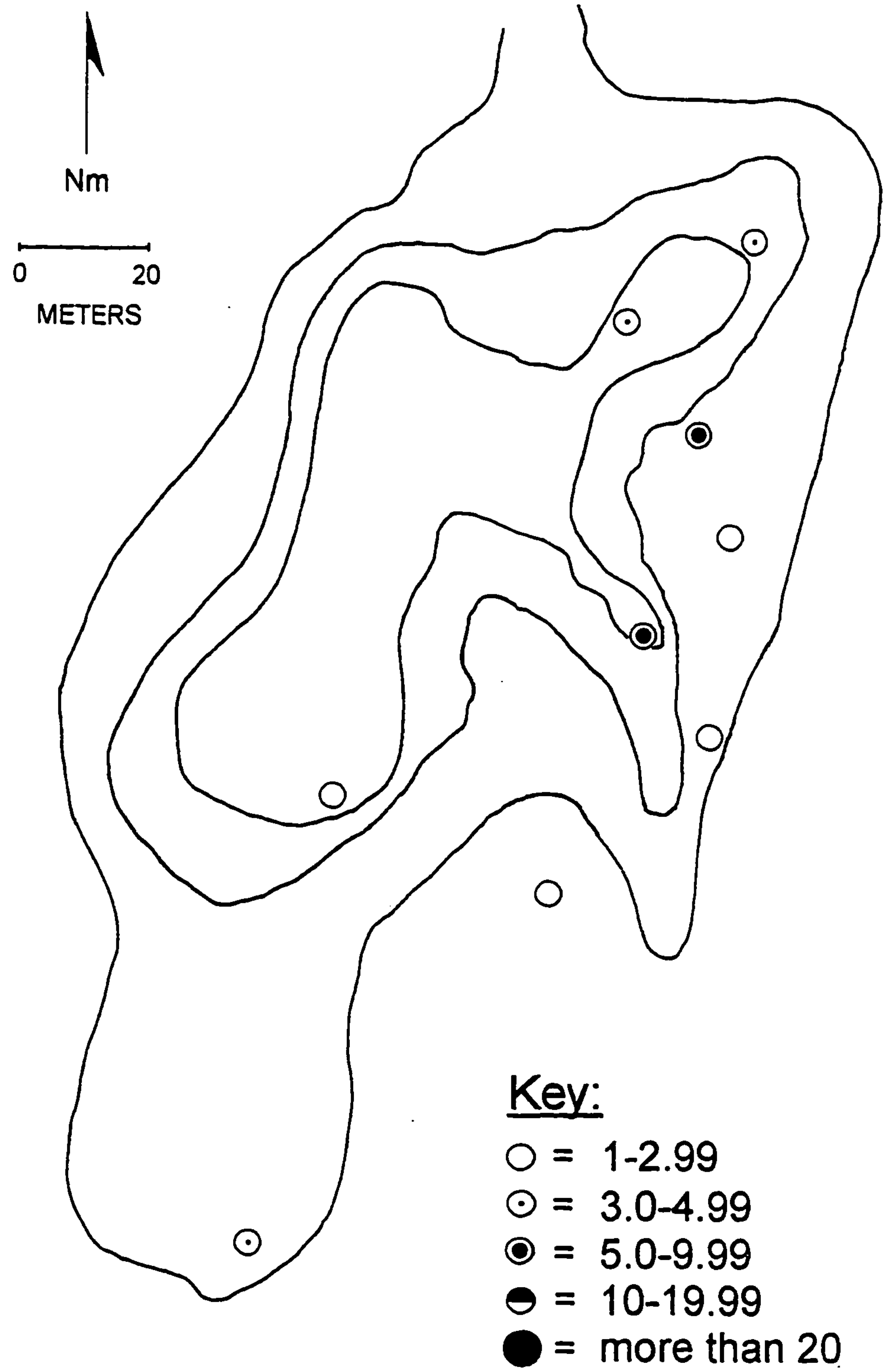


Figure 8.6. Distribution of "thin" (body thickness of 3.9 mm or less) high-polish black-and-red ware sherds at Dhamantri, in sherds per square meter

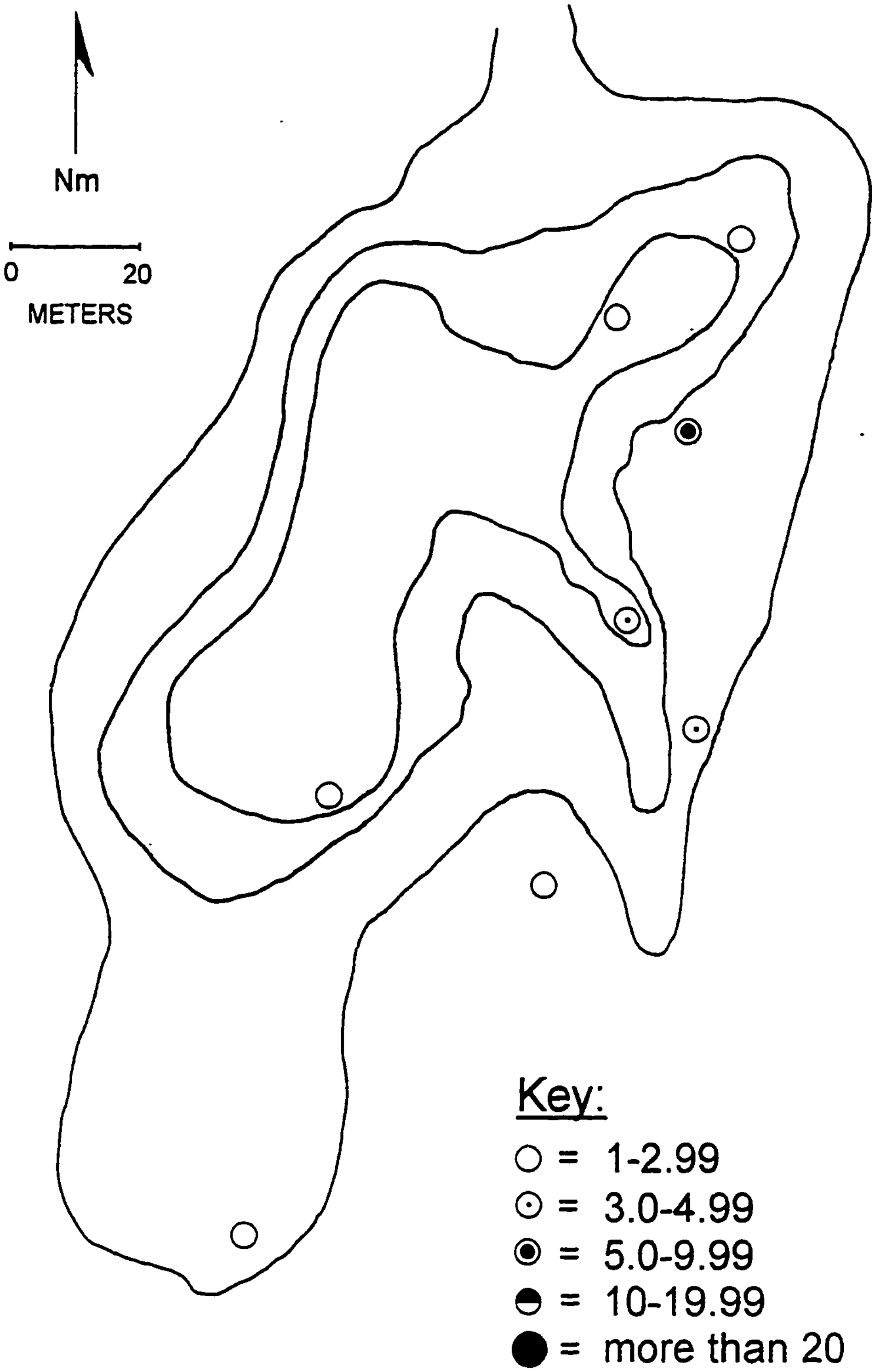


Figure 8.7. Distribution of "thick" (body thickness of 4.2 mm or greater) high-polish black-and-red ware sherds at Dhamantri, in sherds per square meter

indistinguishable from the Kaundinyapura ceramics, does offer firm evidence that the two sites were occupied contemporaneously. The presence of Dhamantri, as a smaller site only four kilometers away from Kaundinyapura, prompts the investigation of the relationship between the two sites and the way in which the inhabitants of the two sites may have contributed to mutually-beneficial social and economic interactions.

## Chronology and rim form

The division of rims into similar forms was undertaken for the purpose of discerning both functional and potential chronological categories among the rim forms identified. The resultant rim forms are shown in Appendix B; Appendix C lists the frequency of occurrence of each rim form at the two sites of Kaundinyapura and Dhamantri. To ascertain the chronology of these materials, the rim forms were compared to nearby excavated sites as well as to the materials from the 1962 and 1964 excavations at Kaundinyapura (Dikshit 1968). The drawn forms of the sherd groups from Kaundinyapura were matched with excavated exemplars according to two criteria: similar morphology and similar diameter. Morphology was based on the general appearance of the published form: flange length, thickness of rim, and for bulbous rims, the size of the bulb compared to body size. The diameter of the rim of the published exemplars was

assessed using the scale associated with the drawing.

As the drawings of excavated materials are sometimes published at quarter-scale (or smaller, for large vessels), some of the details of the morphology may be difficult to assess. The use of a diameter criterion was an additional check on the application of published date estimates to the Kaundinyapura surface material. Information from published reports about inclusions was occasionally utilized to distinguish similar-looking forms which appeared in many periods but sometimes had different inclusions in the paste. Similarly, surface treatment and the presence of inclusions which indicated the fineness of the vessel was utilized to distinguish rim forms from the published drawings where inclusions or firing technique appeared to have a chronological significance. Additional descriptive criteria in the published reports, such as ware colors, were not considered. These descriptive elements are generally not standardized; nor are color differentials found to be a significant means of separating ware types, as noted in the previous chapter.

The results of the matching process are shown in Appendix C. As can be seen, the labels of chronology usually contain a referent to a ruling entity. Such labeling is consistent with the assumption that the presence of coinage associated with political agents such as the Mauryas and the Satavahanas infers the active presence of such agents in the Vidarbha region.

Fortunately, the excavators of sites in the Vidarbha region also attached calendar dates to the phases identified at particular sites, which facilitates the comparison of similar ceramic forms between sites. The ceramic corpus is confined to a few rather basic forms, some of which appear to be extremely long-lived, being found in multiple time periods: e.g., 6-01, 37-05, 84-13. The comparison of Kaundinyapura sherds with exemplars from published site reports reveals that similar forms are assigned similar dates throughout the Vidarbha region. This consistency in dating is perhaps due to the consistency in excavation teams in the region, with a great deal of the pioneering work in Vidarbha undertaken by Prof. S.B. Deo. Although often working with different collaborators, his personal involvement with many of these excavations has probably increased the consistency with which chronology was applied to particular rim forms.

The comparison of the rim forms from the Kaundinyapura and Dhamantri systematic collections with other Vidarbha ceramics produced chronological identification for a large number of the rim sherds collected in this project. Of the 1531 rims from the Kaundinyapura collections which were identifiable (i.e., well-enough preserved to discern a shape) a total of 1084 (71%) could be matched against rim forms from other sites in Vidarbha. From Dhamantri, a total of 63 of the 105 identifiable rims (60%) could be matched. Significantly, only six of the rims were matched

with published exemplars which were labeled as "medieval" or "Muslim", further substantiating that the surface record of neither Kaundinyapura nor Dhamantri has been significantly impacted by occupations postdating the Early Historic period.

### The chronology of non-ceramic artifacts

While the majority of chronological information at Kaundinyapura and Dhamantri is provided by the ceramics, time-markers are also found in other types of artifacts such as tiles, sandstone grinding tools, and bricks.

The appearance of tiles throughout the Vidarbha area postdates the megalithic period, as they are found in excavated habitation layers associated with other Early Historic materials such as coins. One particular type of tile is rectilinear with two holes at one end and has a long groove on one of the long edges and finger-tip striations running the length of the tile, and is commonly identified as "Satavahana" tile (figure 8.8). In the Vidarbha region, these tiles have been located at Paunar in the period IIB levels (1st c. B.C. to mid-third c. A.D.; Deo and Dhavalikar 1968).

Further to the south, in what is now the state of Andhra Pradesh, the tiles were recovered in the 1977-78 excavations at Satanikota in levels of period IIA (mid-first c. B.C. to mid-3rd c. A.D.; IAR 1977-78:7). In the

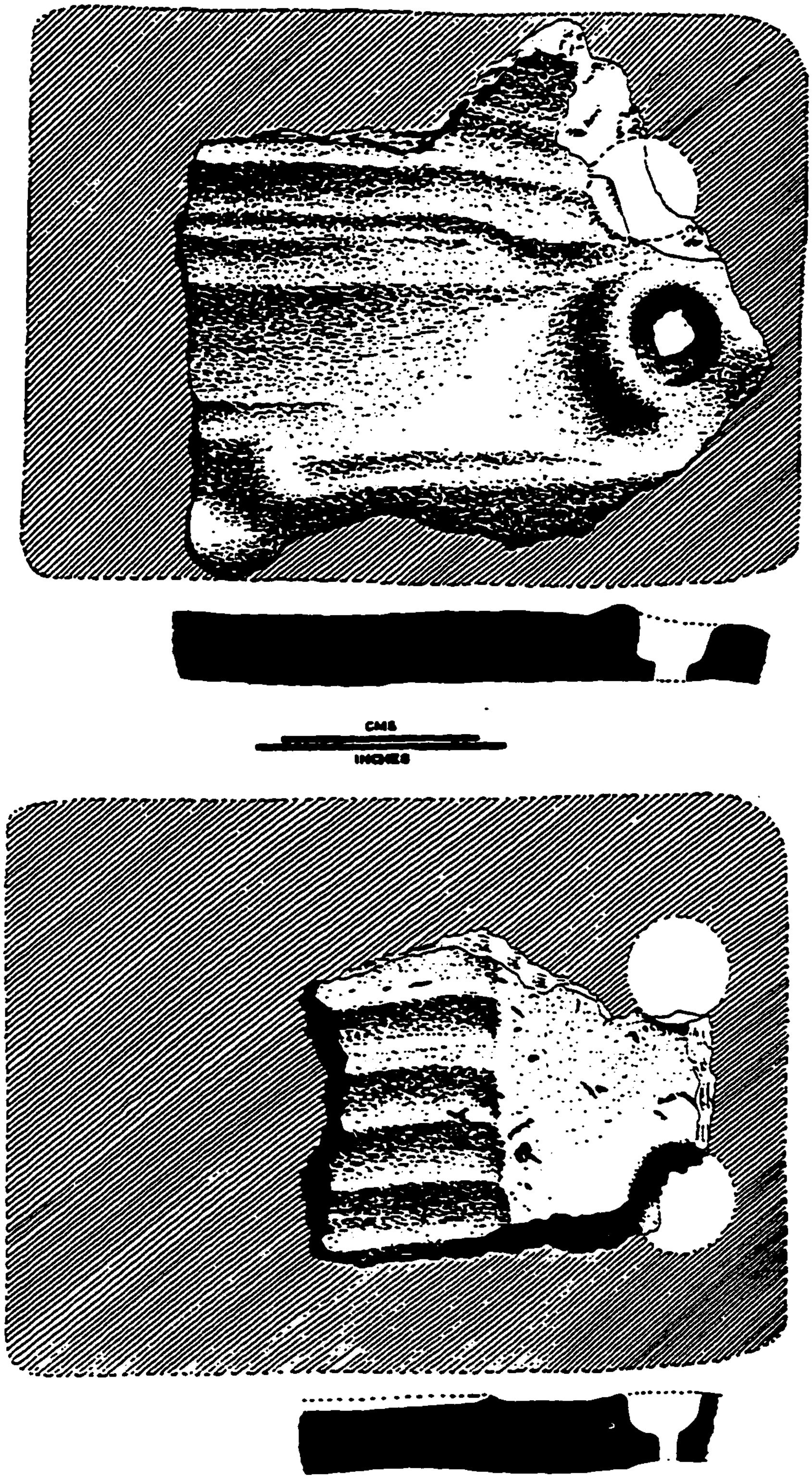

Figure 8.8. "Satavahana" tile of the Early Historic period. Tiles shown are from Ahar (Sankalia, Deo and Ansari 1969:figure 120

north, at the site of Ahar in Rajasthan, tiles of the Early Historic period were recovered (Sankalia, Deo and Ansari 1969). The widespread use of tile roofs in this period is also known through the depictions of buildings in the glyptic art of Sanchi (see Rao 1984).

Stone objects also possess chronological information. At Kaundinyapura, the fragments of two elaborate legged quern stones were recovered, with one fragment from the upper western flank of the location 201 mound, and another fragment found in the plowed fields immediately to the west of the southernmost KDN-II mound (figure 8.9). Other types of stone objects included stone pestles, of a variety also known from the megalithic burials at Junapani (IAR 1961-62:33-34) and at Raipur (Deglurkar and Lad 1992).

## Summary of chronology

In sum, fine-scaled chronological differences cannot be elucidated from this data set. At the same time, the data set as a whole (with the exception of a few exuberant ceramic forms which look to be very late, e.g., post-8th century A.D.) appears relatively coherent. A few basic ceramic forms represent the majority of the diagnostic sherds: everted pendent rims; flared straight rims and flared bulbous rims; plain incurved rims of varying sizes; plate forms and string-cut bases; and very large, thickened rims. Other artifact types also indicate that the site of

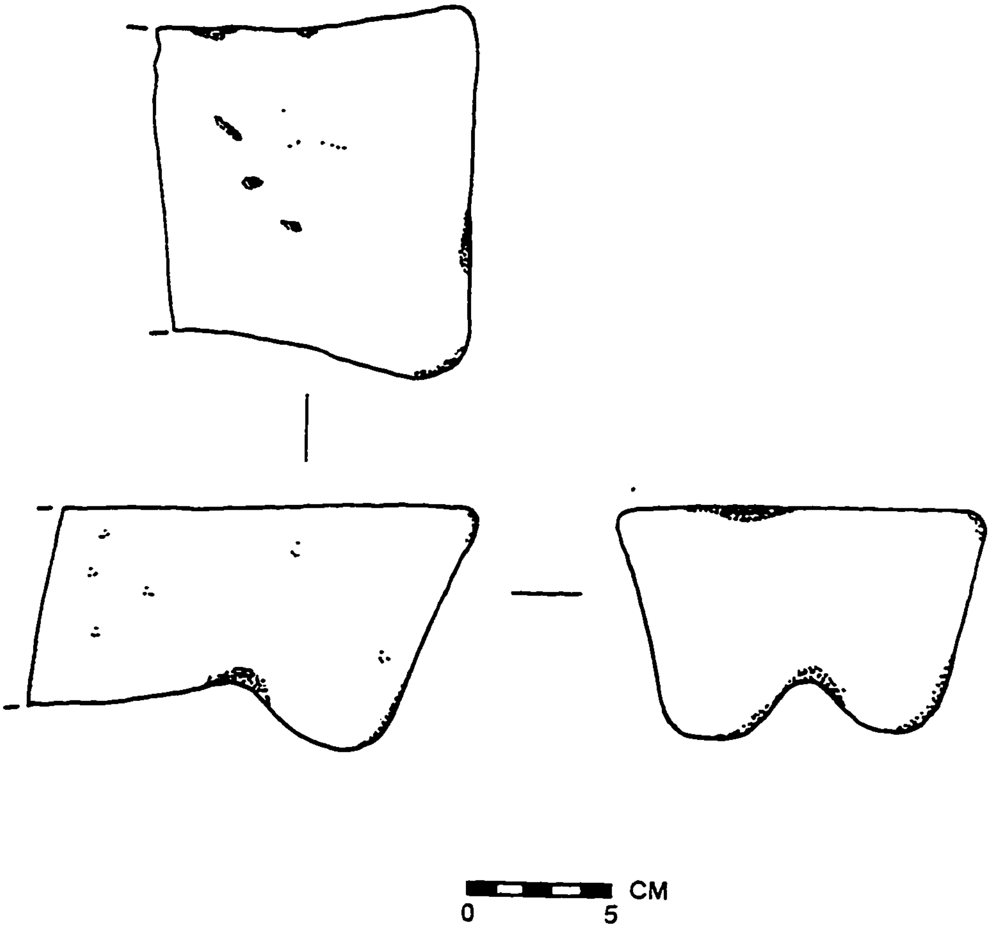


Figure 8.9. Legged quern fragment from Kaundinyapura, recovered as an isolated find 20 meters west of the KDN-II mound; granite with cryptocrystalline flecks

Kaundinyapura was occupied at the same time as other sites in the region which are dated from the late first millennium B.C. to the early centuries A.D.

Because fine-scaled chronological differences cannot be reliably generated from the data set, subsequent analysis is based upon the treatment of the sites of Kaundinyapura and Dhamantri as a single chronological horizon although this means artificially compressing what must be several hundred years of occupational history. The treatment of the site as a "single-period" site is meant to be a heuristic device only; in doing so I do not suggest that the site is static in its responses to economic and political shifts during the Early Historic period. In the following discussion, the economy of Kaundinyapura and its surrounding region are studied from the standpoint of ubiquity, a mode of inquiry for which the scale of data is appropriate. The surface of the site does not represent a single moment of occupation but is instead a collapse of three-dimensional space into two-dimensional space, so that the phenomenon of chronological conflation has already taken place in the formation of the surface record.

Distribution patterns which isolate particular zones of richness may indeed vary on the visibility of the site at any particular moment. By contrast, patterns of ubiquity, such as are demonstrated by the non-local artifacts seen at Kaundinyapura and Dhamantri, cannot be discounted as single-phase phenomena: if they were, the

chances of their being visible now would be exceedingly slim. In the following paragraphs, the significance of the ubiquity of two non-local artifact groups, micaceous pottery and sandstone objects, will be discussed for Kaundinyapura and Dhamantri.

### The distribution of micaceous pottery at the sites of Kaundinyapura and Dhamantri

As indicated in the analysis of the collected ceramics from the sites of Kaundinyapura and Dhamantri, the inclusions or "temper" of the ceramics was noted in the creation of types. The separation of wares according to the content of mica was initially perceived as a means of separating a ware group whose physical properties and appearance were particularly striking (figure 8.10). Subsequently, the presence of mica in pottery was determined to be a marker of cultural similarity with other sites in the Vidarbha region, with many of the previously-investigated sites of the region reported to contain an abundance of micaceous pottery in both habitation and megalithic-burial contexts. This pottery is striking for the very large quantity of mica incorporated into the paste, with up to 40% of the matrix of the sherd consisting of large (2-3 millimeter size) mica flakes. As a result, this pottery is also very friable and fractures easily, a point noted in many of the Vidarbha excavation reports.

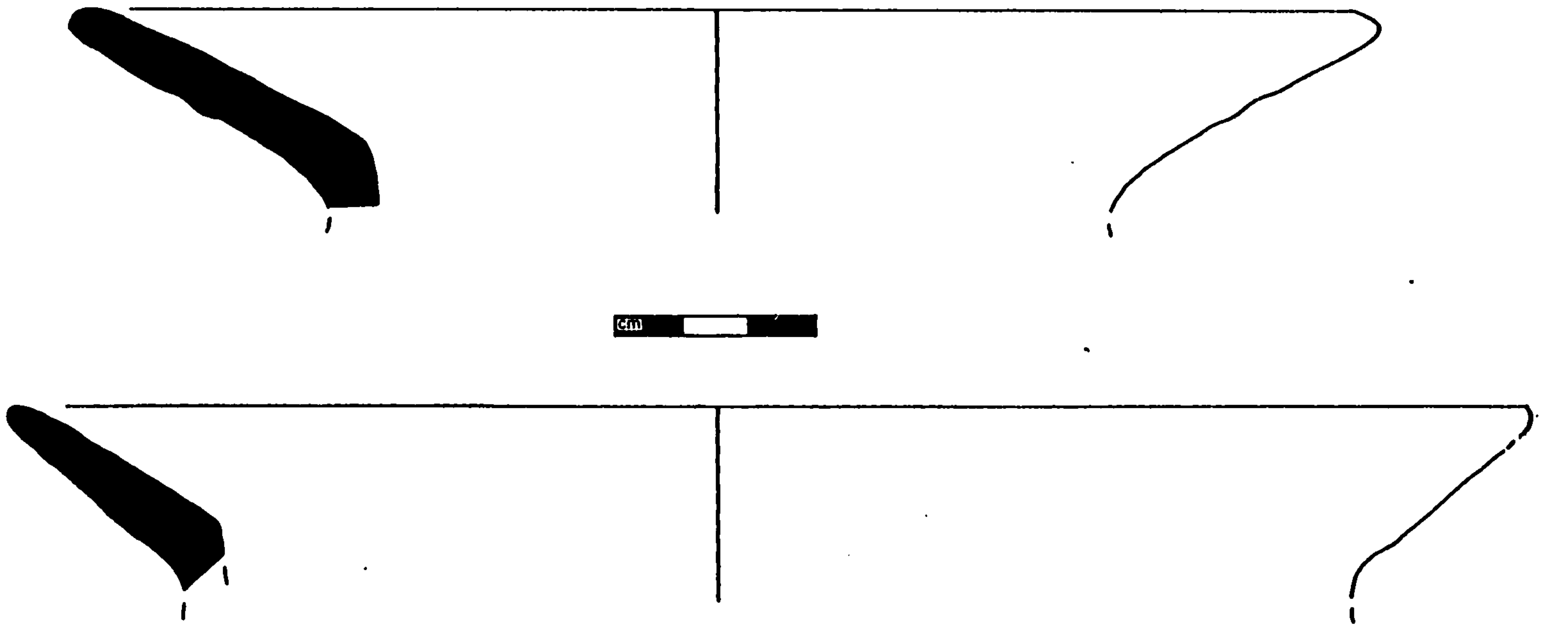


Figure 8.10. Micaceous ware forms, Kaundinyapura

The ware is abundant at Kaundinyapura, with nearly every collection unit producing a significant quantity of micaceous pottery (figure 8.11). The distribution of micaceous ware at Dhamantri is noted in figure 8.12.

The significance of this ware for the analysis of the trade relations sustained by Kaundinyapura is due to the complete lack of mica in the local geologic fabric of the Kaundinyapura region. As noted in figure 4.5, the entire western region of central India is located in the area known as the Deccan basalt province. To the east of the Deccan basalt province are found older geologic formations of the Gondwana supergroup, which contain mineral deposits such as coal along with exposures of sandstone, granite and gneisses (Geological Survey of India, 1974). Among the mineral descriptions of eastern Maharashtra, mica is mentioned as emanating only from Manegaon where there are two ore bands of manganese associated with micaceous quartzite (Geological Survey of India 1974:31-32). However, it should be noted that mica is not considered highly valuable commercially, so that mica deposits may not be fully reported; indeed there should be other deposits of mica in the similar geological environments of the Gondwana supergroup.

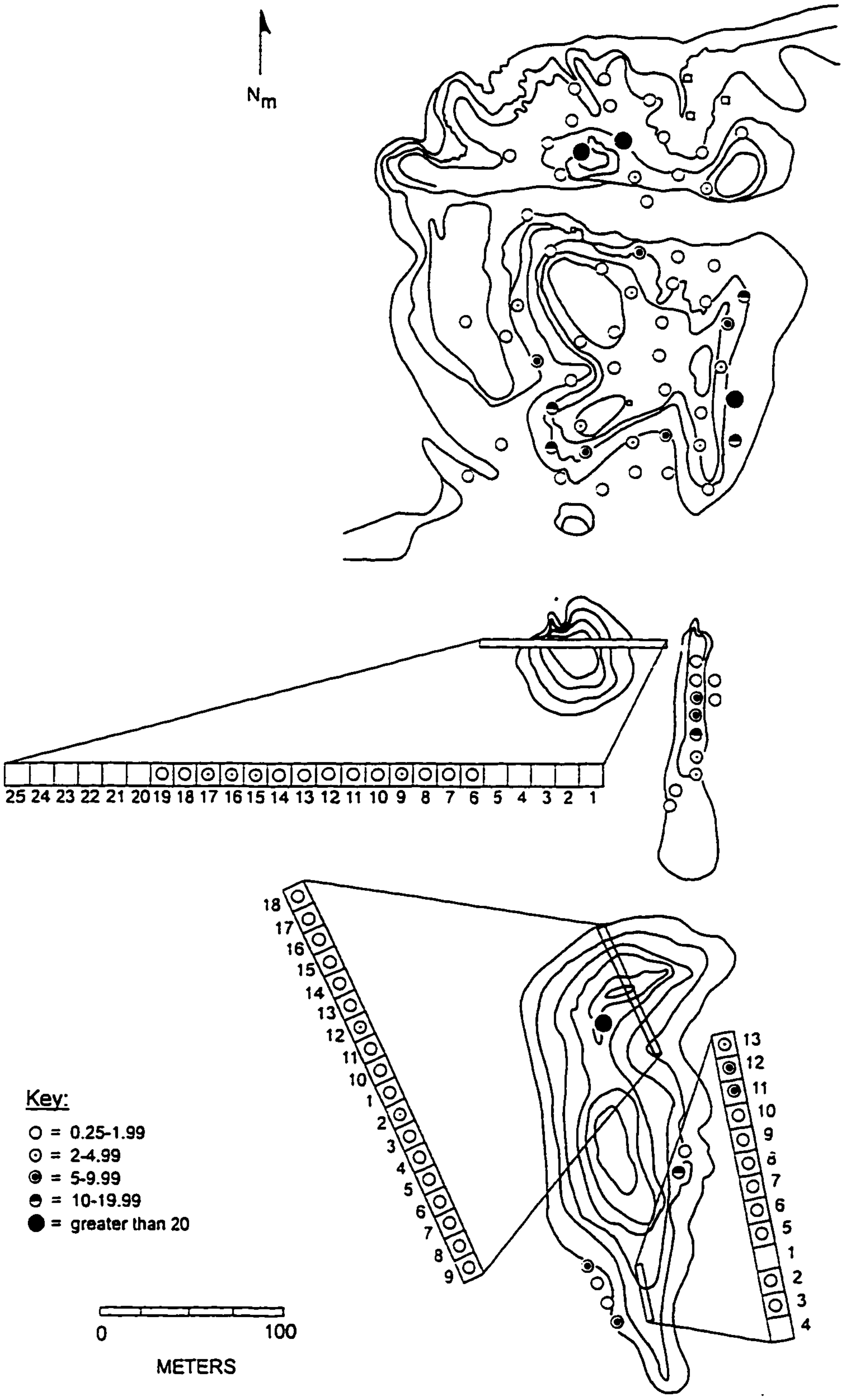


Figure 8.11. Distribution of micaceous pottery, Kaundinyapura, in sherds per square meter

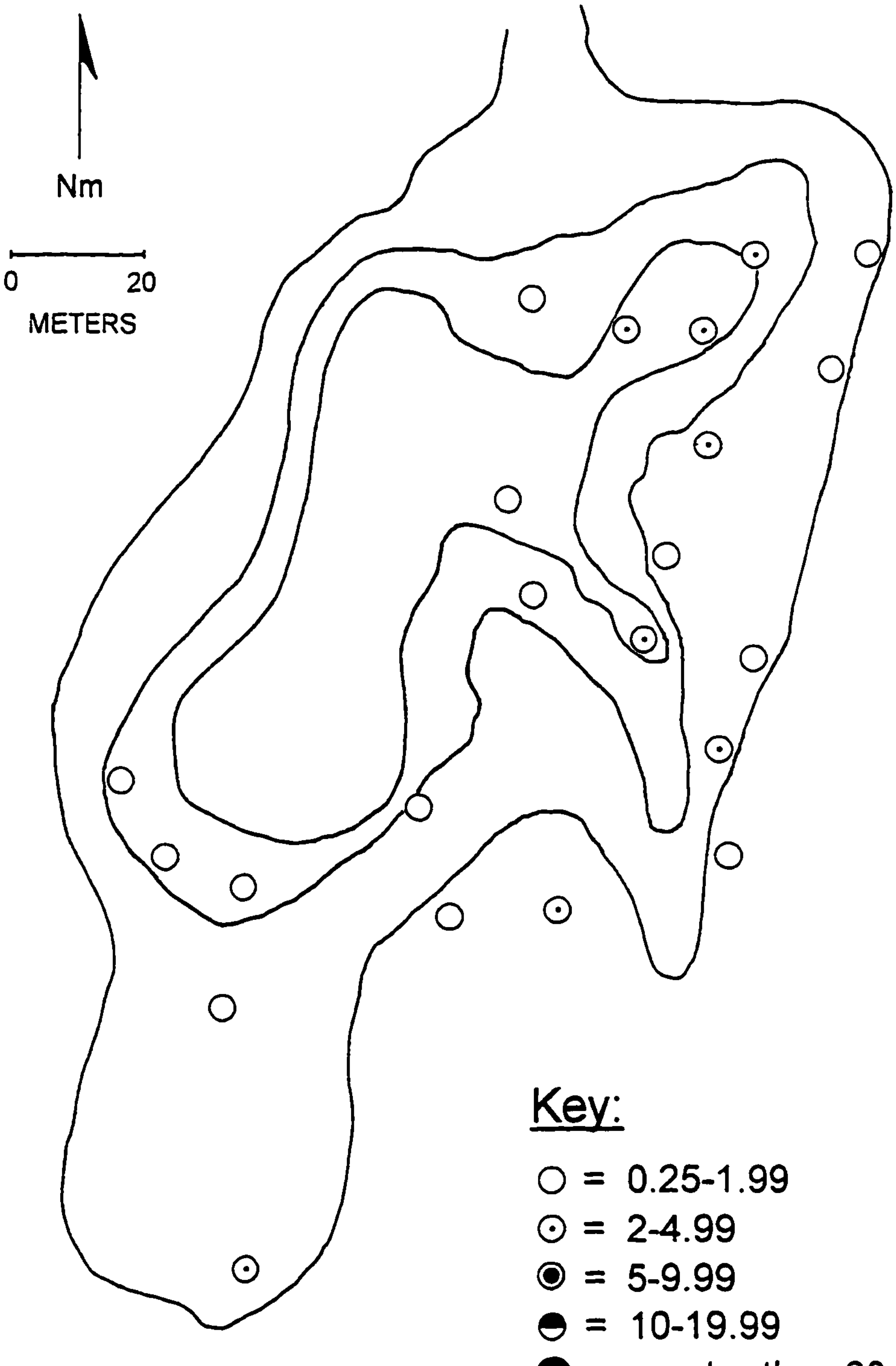


Figure 8.12. Distribution of micaceous pottery, Dhamantri, in sherds per square meter

**The distribution of sandstone objects at the sites of Kaundinyapura and Dhamantri**

Like mica, sandstone is geologically unavailable in the area around Kaundinyapura but also forms an important component of the archaeological record of the site. Figure 8.13 illustrates the distribution of sandstone fragments and sandstone objects at Kaundinyapura; figure 8.14 presents the distribution of such fragments at Dhamantri.

In contrast to the reporting of mica sources, the location of sandstone sources has been sought with considerable interest. In the British period, the desire for suitable construction material led to an exploration and valuation of the different sandstone sources in the Nagpur area (e.g., Russell 1906). More recently, the presence of different types of geological resources has been avidly researched by the Geological Survey of India in the pursuit of profitable materials such as coal and other minerals. These various sources provide locations of sandstone, and no mention is made of any sandstone in the area around Kaundinyapura: for example, of the Wardha district, Grant says that "the red soil and laterite are generally wanting, and the sandstone and plutonic rocks, which no doubt underlie the trap, are very seldom exposed to view" (Grant 1984[1870]:514). Examinations of the Amravati district indicate a similar geological homo-geneity, with an early geologist noting that "except for two small inliers of

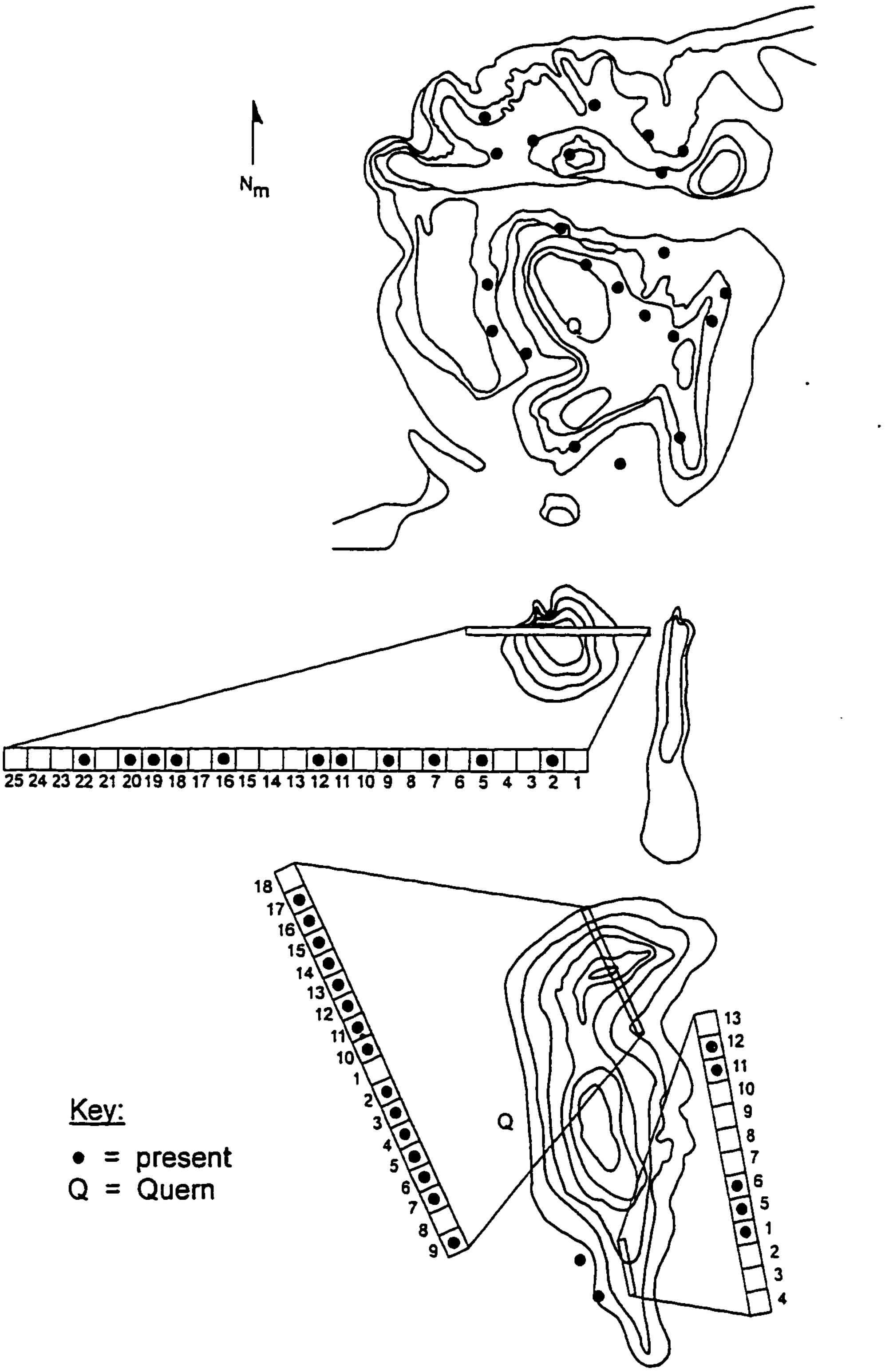


Figure 8.13. Distribution of sandstone from systematic collection units, Kaundinyapura

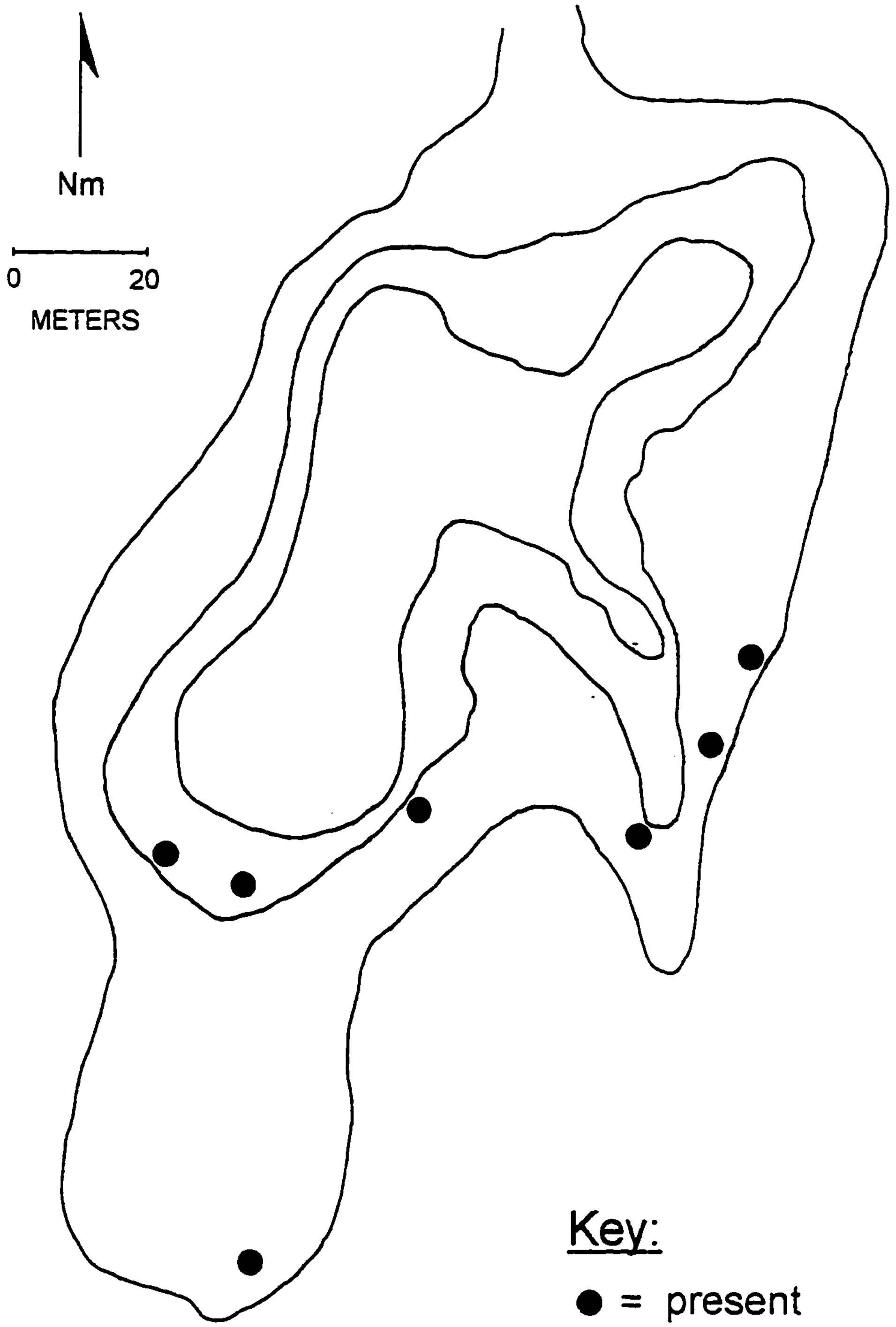


Figure 8.14. Distribution of sandstone from systematic collection units, Dhamantri

Lameta, Gondwana and metamorphic rocks along the northern boundary of this District and occasional patches of laterite, the only geological formations represented are Deccan Trap, and the alluvium of the Purna valley" (L.L. Fermor, reported in Fitzgerald and Nelson 1983[1911]:5).

To the east of Amaravati and Wardha districts are areas geologically rich in sandstone. One of the most prevalent sources of sandstone is the Kamthi beds, located in an area about 25 miles (45 kilometers) long from northwest to southeast near Kamthi (north of Nagpur), and containing "hard compact gritty sandstones, fine variegated sandstones, coarse loose-textured sandstone, very fine-grained deep and bright red and buff argillaceous or argillaceo-siliceous sandstones" (Grant 1984[1870]:xxxiii). Sandstones are also found in the Chandrapur district, where they are more widely exposed. Like the variety of sandstones described in these outcrops, the sandstone recovered in the Kaundinyapura and Dhamantri collections exhibits a similar range of grain size and color, suggesting that it was obtained from many different areas beyond the edge of the Deccan basalts.

### The social meaning of non-local goods in the environs of Kaundinyapura

The value of sandstone as a social marker is indicated by its presence in the megalithic burials of Vidarbha. At

Junapani, the cultural assemblage of the three excavated megaliths included gold ornaments, iron implements, copper ornaments and a bell; in addition, the burial assemblage included a variety of ceramics, and one of the megaliths contained a sandstone pestle (IAR 1961-62). Similarly, the megaliths excavated at Raipur contained stone pestles in the burials: one cylindrical pestle made of quartzitic sandstone in megalith 3, and one grinding stone of red quartzitic sandstone in megalith 7 (Deglurkar and Lad 1992).

The same types of pottery and sandstone implements are also found in the habitation deposits associated with the megaliths in Vidarbha. The juxtaposition of what appears to be ordinary household articles such as pottery and sandstone grinding tools, with preciosities such as gold ornaments and iron tools, indicates that objects of everyday domestic use were invested with symbolism. The presence of goods also known from habitation contexts in a burial served to signify that the interred individual was a person fully integrated into that culture, participating in multiple cross-cutting social groups simultaneously based on age, gender, reproductive status, political status and possession of wealth or special expertise.

The use of goods as symbolic markers which contextualize the dead are logical extensions of the social contexts of the living. The "meaning" of goods as they are deposited into finite, single-assemblage burial contexts

may represent only a subset of the meanings which are projected when those same goods are utilized and displayed in ongoing social contexts, where combinations of objects can be rearranged to frame particular types of communication. Nonetheless, the presence of objects in burial and habitation contexts indicates that objects were actively perceived as markers of social identity, and were an essential form of social expression.

The recovery of both micaceous pottery and sandstone implements at Kaundinyapura and the smaller site of Dhamantri prompts the investigation of why these items were deemed valuable. Sandstone and mica have physical properties which make them useful for accomplishing certain kinds of tasks, but more readily-available substitutes can be documented in the vicinity of the Wardha valley. Local substitutes for sandstone grinding tools exist, in the form of many types of both fine-grained and vesicular basalts which can be shaped into any form and utilized for grinding and pounding tasks. If the advantage of mica in ceramics lies in its ability to improve thermal qualities, this advantage can also be gained by the use of straw or quartz temper, both of which are locally abundant. Mica is also a platy substance which can help prevent cracking in pottery, but such properties are also found in calcinated and uncalcinated shell (Rice 1987:407). Freshwater shell is available all along the Wardha river, and nearly every collection unit at Kaundinyapura contained a small amount

of freshwater shell (usually uncalcinated). By contrast, only mica produces a distinctly shiny appearance; likewise the bright red or pink color of much of the sandstone found at Kaundinyapura and Dhamantri makes it distinctive among the collection of artifacts.

The use of non-local goods such as sandstone and mica at Kaundinyapura and its environs suggests that they were desired for their symbolic value as well as for their physical properties. The presence of a similar ceramic assemblage in megalithic and Early Historic sites in Vidarbha indicates that the inhabitants of these sites participated in a common tradition. Ceramic styles can however be transported with a minimum of social interaction between sites, and could be limited to the presence of traveling potters who manufacture or transport pottery in different locales. By contrast, the acquisition of non-local goods for domestic use by the entire population of a site, as is demonstrably the case at Kaundinyapura, indicates large-scale participation in a common culture. To effect such participation, the economic activities of the site necessarily included a production of surplus which could be utilized to acquire non-local goods. The structure of those economic activities, as reconstructed from ethnographic, historic and archaeological evidence, forms the subject of the following chapters.

# CHAPTER IX

## POPULATION DENSITY AND THE OCCUPATIONAL HISTORY OF THE WARDHA VALLEY

The reconstruction of exchange activities begins with a critical examination of the changes which have been effected on the landscape surrounding Kaundinyapura. Many of these changes can be documented archaeologically, although the presence of historical documents from the nineteenth century assists considerably in interpreting that archaeological record. In this chapter are presented the results of the extensive survey carried out within a 10-kilometer radius of Kaundinyapura. The evidence gathered during the course of this project indicates that the level of population density currently visible constitutes a historic high and that population levels prior to the nineteenth century were considerably lower. Documentary sources from the past two centuries indicate that the recent population density is due to colonial-period shifts in agricultural cropping which favored cotton production.

## The archaeological survey of the area around Kaundinyapura

In chapter five, the methodologies utilized in the various stages of this archaeological project were set forth and explained. The methods utilized in the assessment of the 314 square-kilometer area around the site of Kaundinyapura provided information about the surrounding area, recovered additional archaeological sites, and placed the site of Kaundinyapura in its geographical and topographical context. The survey methodology was designed to gather general information about the area, including the assessment of underlying archaeological deposits in presently-occupied towns. The localities recorded in this survey are noted in table 6.1 and plotted in figure 6.9. An illustration and description of each recorded locality is presented in Appendix D.

As noted earlier in this text, the two sites of Kaundinyapura and Dhamantri clearly represented occupation of the Early Historic period, the time period which was the central focus of inquiry. Only one other locality contained any artifacts of that era, and this was locality 7, across the Wardha river from Dhamantri and in direct view of the latter. At locality 7, several sherds of thin, well-burnished 400 series wares ("black-and-red") wares were noted in a widely scattered area along the upper banks of the Wardha river. As no other artifacts indicative of a

settlement site were located, it was concluded that locality 7 represented a crossing-point or temporary encampment.

The remainder of the localities which were recorded as part of this project presented an entirely different set of diagnostic artifacts, principally in the form of ceramics. The sampling strategy utilized was largely opportunistic due to the dense nature of human occupation in modern villages and the resultant small number of exposed locales which provided a glimpse of underlying deposits. The active recycling of archaeological deposits for replastering and the construction of new housing in the modern villages was a consistent observation in this survey (seen especially at localities 2 and 4).

The inspection of modern house walls, in addition to the investigation of open areas, pits, and eroded zones, maximized the potential for the recovery of archaeological materials. When compared on a presence-absence basis, the ceramics from the recorded localities form a uniform corpus of material which is markedly different in both form and fabric from the ceramics recovered at Kaundinyapura and Dhamantri. Comparative collections which could date these survey ceramics are relatively rare, but the very thin habitational deposits (e.g., 0.25-1 meter) which underlie the recorded localities and the limited variety of forms and wares suggest that they are very recent in date.

**Population density in the Wardha valley**

The archaeological record indicates that the large-scale habitation of the Wardha valley is relatively recent. Early documents also reveal that population density in the 18th century was relatively low and that population centers were relatively rare. This conclusion is supported by the general lack of information about towns in the areas which were to become the Central Provinces and Berar; one early document, from 1793, offers that "We know less of the interior parts of Berar, than of most other countries in Hindoostan; but, by what we do know, it does not appear to be either populous or rich" (Rennel 1976[1793]:92).

Early colonial-period documents such as Rennel's itinerary also indicates that there was a relative lack of strategic interest in this portion of Central India. In the 1860's, the attention paid to the region increased dramatically due to the attractiveness of the Wardha valley as a region for the production of cotton (e.g., Thornton 1984[1858]). The area was fully developed by the colonial authorities after the American civil war cut off England's supply of raw cotton from the southern United States (Grant 1984 [1870]).

The population and environment of the Wardha valley was greatly affected by the rapid transition of the area from one of a broad crop base to high-production monocropping. Food was brought in from the Nagpur area so

that a greater proportion of the Wardha valley could be devoted to cotton, and there was a great demand for labor both for cotton production and the construction of the railroad (Kitts 1882). Census figures from the specific areas around Kaundinyapura indicate the tremendous and rapid growth of population in the latter portion of the nineteenth century (Table 9.1). The increased prosperity also meant an increase in wealth, which prompted an increase in the number of farm stock and imports of cattle (Kitts 1882). The upsurge in population also meant a change in crop mixture, since some of the newcomers were from the Punjab and other areas which were traditionally greater consumers of wheat (Kitts 1882).

## Population stresses

With the potential agricultural wealth of the Wardha valley region proven by the increase in production following the 1860's, one might raise the question of why the area was underpopulated prior to that time. Framing the question in such a way presumes that evolutionary progress towards greater social complexity is subjectively desirable. However, such complexity also brings negative implications, in that the imposition of political constructs can create or exacerbate the ills of environmental variability. When poorly managed, political constructs result in instability which leads to conflict in the form

| Place | Date | Population | Source |
|---|---|---|---|
| Arvi | 1872 | 6732 | Census of India 1881 |
| Arvi | 1881 | 8072 | Census of India 1881 |
| Arvi | 1908 | 10,678 | His Majesty's Sec. of State 1908 |
| Chandur taluk | 1872 | 127,642 | Kitts 1882 |
| Chandur taluk | 1881 | 171,611 | Kitts 1882 |
| Jalgaon | 1870 | 2000 | Grant 1984[1870] |
| Jalgaon | 1881 | 2121 | Census of India 1881 |
| Kaundinyapura | 1911 | 413 | Fitzgerald and Nelson 1983[1911] |
| Talegaon | 1872 | 4198 | Kitts 1882 |
| Talegaon | 1881 | 5506 | Kitts 1882 |
| Talegaon | 1901 | 6220 | His Majesty's Sec. of State 1908 |
| Talegaon | 1911 | 6692 | Central Provinces Gazetteer 1913 |
| Wardha Dist. | 1872 | 354,720 | Census of India 1881 |
| Wardha Dist. | 1881 | 387,221 | Census of India 1881 |

**Table 9.1. Population figures for towns and regions in the vicinity of Kaundinyapura in the late nineteenth and early twentieth centuries.**

of warfare or raiding. This instability prevents individuals and groups from moving about the landscape and engaging in the kinship and exchange networks which are critical for social success. The result of political instability is seen in population decline due to death by warfare, permanent emigration, famine and disease.

The record of famine in central India indicates that it was a relatively frequent occurrence at least as early as the 14th century A.D. Historical records indicate that famines occurred during the reign of Muhammad Shah Bahmani (1378-97), and again in 1417, 1472-73, and 1630-31 (Fitzgerald and Nelson 1983[1911]). Direct observations of famines are recorded for 1807 and 1808 in southern Berar, when the scarcity of food along with the depredations of the raiding Naik and Bheel groups caused agriculturalists to relocate to walled towns (Hamilton 1993[1828]:220). Famines were recorded for the Amravati district in 1803 and 1833 (Fitzgerald and Nelson 1983[1911]) and again in 1839, 1897-8 and 1899-1900 (Fitzgerald and Nelson 1983[1911]; His Majesty's Secretary of State 1908).

In the Central Provinces there were famines recorded for c. 1880, 1896-98, and again in 1899 (Awasthi 1980-81); in the 1896-98 famine, failure of the monsoons was specifically cited as the reason (Awasthi 1980-81). Census figures from this period show a drop in population, but this is noted as due only in part to loss of life, with a substantial portion of population decrease due to

"emigration, both temporary and permanent, to the richer tracts of Nimar and Berar" (Fitzgerald and Nelson 1983[1911]:107). These observations by contemporaries indicated that the periodicity of famines was irregular and unpredictable. A comparison of the dates also indicates that famines appear to have had particular severity in different areas at different times. Population stresses also occurred in the form of sweeping illnesses; the compilers of the 1911 Gazetteer for Amravati district note that in the early 1900's, there were several outbreaks of "plague" killing off several thousand people at a time (Fitzgerald and Nelson 1983[1911]:107-127).

The effects of warfare and banditry include the cessation or suppression of any activities which involve travel. To protect themselves against raiders, settlements may move to more defensible ground or erect fortifications to protect the inhabitants. In the reconnaissance survey undertaken in the 10-kilometer radius around Kaundinyapura, numerous signs of such fortification were evident. Remnants of fortifications are seen in the dramatic mud-towers at Khubgaon (locality 19) which stand as the entrance-portal of a large mud-wall enclosure now partially enveloping the modern village. Other mud-wall fortifications are seen at Ghota (locality 4) and Ahirwada (locality 30). There is also the possibility that the village of Yeklara (locality 44) also had a mud-built fortification: it is noted as having a mapping symbol for

"fort" on the 1970 Survey of India map. When the survey team from this project visited the small modern village at Yeklara in 1995, the residents also indicated that there had been such a construction though it has since been dismantled.

From these sites in the survey zone with demonstrable evidence of fortification, the only ceramics collected are forms which postdate the Early Historic period. In addition, there is little accumulation of cultural material which would indicate the longevity of settlement, further suggesting that these mud-constructions are probably of relatively recent date and are no more than 200-300 years old. Historical documentation supports the interpretation of sites such as Khubgaon as constructions of the 18th century, related to the surge in political activity in this area associated with the establishment of the Bhonsle dynasty in the Nagpur region. In the early 1800's, raiding bands of Pindaris ventured into this area from the Tapi valley; the author of the 1870 Gazetteer of the Central Provinces of India observed that "the plain of Berar and the valley of the Wardha have even now a semi-warlike appearance from the mud forts which a peasantry...was obliged to erect in very self-defence" (Grant 1984[1870]: xciv).

## Environmental changes

James Rennell, in his 1793 account, observed that while the Nagpur area was well-cultivated, the "general appearance of the country at large, and particularly between Nagpour (sic) and Bahar [to the west], is that of a forest, thinly set with villages and towns" (Rennell 1976[1793]:282-299). Another early observer, William Lloyd, recorded his observations of the countryside in a journey from Nagpur westward to Amravati in 1808 (Lloyd 1808a, 1808b). The area between settlements is described as consisting of jungle and low brushwood, with cultivation limited to the area of the few villages which line the route; in particular, he notes that the country from Sawlee westward to Talegaon is "overrun with Jungle" (Lloyd 1808a:9). In contrast, he describes the area between Talegaon (10 kilometers east of the river) and the Wardha river as "in a very high state of cultivation" (Lloyd 1808b:93).

The premodern environment can also be addressed through archaeological remains. At Tuljapur Garhi, a chalcolithic site (dated from the late second millennium to first millennium B.C.) located 65 kilometers northwest of Kaundinyapura, the wild animals present (including several varieties of deer as well as some evidence of wild pig) are suggestive of "an open scrub jungle in the vicinity of the site" (Thomas 1992b:74). These conditions appear to have

been prevalent throughout central India; he notes that in the "majority of Iron Age settlements, especially from the Vidarbha region of Maharashtra and some of the adjoining chalcolithic cultures of central India, pig bones (both wild and domestic) were found in abundance" (Thomas 1992b:74).

## Agricultural yields and population

The parameters for either a subsistence or a surplus level of agricultural production projected for the Early Historic period can be calculated for Kaundinyapura and the surrounding area. As above, the population density in the Wardha valley after 1860 represented a tremendous increase following the responses to external stimuli for the increased production of cotton. The continued growth of the population can be assessed through both census documents and the size of settlements (measured on successive topographic maps of the area). However, even this modern level of population does not appear to have maximized the use of productive area in the Wardha valley. Observations made during the survey carried out for this project in 1994 and 1995 indicated that population density had not maximized land use resources as judged by several factors: there is still a substantial distance between settlements; areas of potential agricultural land are lying fallow; and there appear to be few other pressures on the

land which constrain population growth. For example, the massive flooding from the excessive 1994 summer monsoon displaced some groups of people; in at least two cases (the villages of Durgvada and Shindvadi, both on the western side of the Wardha river) whole villages or portions of villages have now permanently relocated to higher ground within one-half kilometer of the original dwelling-site. This movement is indicative of the potential for land to be reclassified away from agricultural production to other uses without undue difficulty.

The current level of population and the number of population centers is considerably higher than is documented for the Early Historic period. In the reconnaissance of the survey area utilizing a 10-kilometer radius from Kaundinyapura, only two sites of the Early Historic period were identified. In addition, some areas which had similar topographic positioning were scrutinized with particular care to ensure that there were no Early Historic sites, but no evidence was found. Judging by modern usage of the landscape with the current level of population, it can be argued that the area of arable land within walking distance would have far exceeded the needs of the populations at Kaundinyapura or Dhamantri.

Another means of assessing the potential agricultural area of the ancient settlement is to utilize minimum caloric needs and population sizes to formulate an estimate of agricultural area. Such an approach was used by

Dhavalikar and Possehl for their study of agricultural needs at the chalcolithic site of Inamgaon in western India (Dhavalikar and Possehl 1974). Utilizing an estimate of minimum caloric needs at 2000 calories per day per person, they projected the acreage required for a prehistoric population of *n* size based on the average yield of rice, wheat, and jowar for the years 1909-1919 from the Season and Crop Report of the Bombay Presidency (Dhavalikar and Possehl 1974:41). While they calculated that a figure of 0.67 acres (0.27 hectare) was sufficient to satisfy the consumption requirement, an additional factor to cover spoilage, seed, and the use of some land for vegetable crops was added to produce a figure of 1 acre (0.40 hectare) per person per year (Dhavalikar and Possehl, 1974:41).

Utilizing a similar strategy for the calculation of population density and needs for Kaundinyapura, the following numbers are generated. First, the population size must be considered. The mounded area of Kaundinyapura is 6.5 hectares. As Dhavalikar and Possehl (1974) discuss, the estimate of population size from archaeological surface area is problematic; in their presentation they utilize a variety of different calculation methods based on probably population densities per hectare elsewhere in Asia (Dhavalikar and Possehl 1974). Calculating population estimates from the densities suggested by Adams for Iraq (200 people per hectare), Kaundinyapura's population could

be calculated at 1300 persons (Adams 1965). If an estimate based on the Harappan population/area parameters are utilized (133 people per hectare), Kaundinyapura's population estimate would drop to 865 persons (Fairservis 1967). For a modern reference, the village of Kaundinyapura contained 413 inhabitants according to the census of 1911 (Fitzgerald and Nelson 1983[1911]). The current size of the village stands at approximately 3.5 hectares.

The estimates based on density figures suggested by Adams and Fairservis only cover the mounded portion of the site and it is possible that the low-lying areas adjacent to the mounds at Kaundinyapura also had habitations. However, given the annual flooding which would have rendered such habitations unsatisfactory in the monsoon, it is assumed that such habitations would be of a temporary nature, such as would be associated with itinerant herders or traders. The second population estimate, which is based on Harappan models and includes an allowance for public space between dwellings, is perhaps less applicable in the case of Kaundinyapura, where it is unlikely that the limited areas of natural mounding would have allowed for a large amount of public space between dwellings. Again, it appears reasonable to assume that any public grounds were on the flatlands, conserving the mounded areas for habitation.

Allowing for crowding and temporary emigration of

lowland-dwellers during the monsoon, it does not appear likely that the population was greater than 1500 individuals at any time during the Early Historic period occupation of the site at Kaundinyapura. Utilizing the figures generated in Dhavalikar and Possehl (1974) for the minimum acreage per person, the total required agricultural area to support the population of Kaundinyapura would be 600 hectares.

Given the observation of alluvial soil within 300 meters on each side of the Wardha river, this would mean that the inhabitants of Kaundinyapura would have required the use of a total of kilometers of river-bordering alluvium. This would amount to a total of 20 kilometers of linear distance along the banks of the Wardha river; if centered on Kaundinyapura, it would result in the use of the alluvial, river-bordering area for 5 kilometers north and south of the site, on both sides of the Wardha. Even if only the alluvial areas bordering the river were utilized, all of the agricultural land required for the sustenance of the Early Historic population would have been within 2 hours' walking distance. It is more likely, however, that arable land which was not adjacent to the river was also utilized, although such arable land is interspersed with scrubland having very thin soil deposits.

The further application of the Dhavalikar-Possehl equation to the Kaundinyapura case contains a serious limitation, in that the comparative yield figures were

assumed to be a standard yield, calculated as a single average from one decade of production figures. The use of a single crop average as an assumed standard for the calculation of a fixed area of agricultural land which would be required greatly simplifies the model but introduces the misleading impression that fluctuations are negligible. However, evidence gathered from census and crop records specific to the area around Kaundinyapura indicate that crop yields fluctuate considerably from year to year. The variability in crop production from year to year in this portion of central India is considerable, and provides a critical insight into the way in which subsistence needs must be addressed under fluctuating environmental conditions.

## Conclusion

The strategies of food production, and the many wild resources which could substitute for cultivated items, indicate that the subsistence needs of the inhabitants of Kaundinyapura could have been supplied by the immediate surroundings. As the next chapter will show, the minimal threshold of surplus production was not directed towards subsistence, but towards the maintenance of an adequate surplus for exchange.

## CHAPTER X

## ENVIRONMENTAL RECONSTRUCTION AND THE PRODUCTION OF SURPLUS GOODS AT KAUNDINYAPURA: A MODEL FOR SURPLUS PRODUCTION AND EXCHANGE

As indicated in the previous chapter, the archaeological documentation of relatively recent population increases in central India is matched by historical documents which chronicle population movements and economic shifts. These documents also provide information vital for the reconstruction of premodern trade, through the illustration of the variety of perishable items which may have served as trade goods. Combined with paleobotanical information, documentary evidence from the early modern period enables a reconstruction of the ancient landscape and the range of extractive activities which could have been practiced at Kaundinyapura and its environs. The list of traded items can be compared with a compilation of the ways in which these goods may have been moved: by kin-based parties, work parties, religious pilgrims, regular traders, pastoralist-traders and itinerant manufacturer-traders.

The processing of perishable and non-perishable goods provided Kaundinyapura with the necessary surplus required to participate in economic activities with its neighbors. More significantly, the transactions in perishable goods

were probably also prompted by social as well as economic factors, and like the exchange of durable goods signaled large-scale participation in a common cultural tradition.

## Local production of durable goods

From the evidence presented in chapter eight, it is clear that the inhabitants of Kaundinyapura were successful in acquiring non-local goods. The extensive distribution of durable goods such as sandstone and mica, especially at the larger site of Kaundinyapura, suggests that the majority of the inhabitants participated in consumption activities involving medium-distance exchange. The ensuing question is what the inhabitants of Kaundinyapura were producing to finance their consumption of non-local goods. As indicated in chapter six, systematic pedestrian survey around the sites of Kaundinyapura and Dhamantri did not produce evidence of subsidiary production zones away from the mounded areas of the site. However, there are two other means by which the evidence of production activities in durable goods can be assessed from the materials found on the mounded portions of the site: by inference through the examination of the products themselves, and through the study of waste materials from manufacture.

The assessment of production strategies from finished products is a problematic venture. Well-made goods may indicate specialist production when the skills needed to

manufacture items could only be acquired through the investment of time away from subsistence activities. Goods made of intractable materials or those requiring a lengthy extractive process also contain the inherent suggestion that their manufacture required a level of labor investment (whether by individuals or corporate groups) which could not have been undertaken by all sectors of the population. By contrast, poorly-made products may be indicative of a number of factors including the skill of the manufacturer. However, other factors also affect the quality of goods, such as the market audience for particular items, or the intended use of the item. Finally, many production systems may be in effect simultaneously, in which similar goods could be produced both by specialists and non-specialists (see Sinopoli 1991).

Observations of modern industrial production generate the expectation that cost effectiveness and quality control are desirable factors in the production of goods, and that variability in processing and resource selection will decrease as production becomes more routinized (Rice 1987a:201). To be most efficient, routine production may be undertaken by specialists, who trade their expertise (in the form of finished products) for subsistence or other goods produced by other kinds of specialists. In the examination of archaeological evidence, the expectation is that that specialized production results in products which have less variability between exemplars (Allen 1992,

following Rice 1987a). Under this assumption, archaeological examples can be evaluated to determine the level of standardization and the likelihood that any particular artifact type is the result of specialized production. Because of the large volume of ceramics which are generated in complex societies, studies of standardization and the organization of production have tended to focus on ceramics (e.g., Longacre, Kvamme and Kobayashi 1988).

However, there are significant critiques which can be offered of the attempt to link the form, style or quality of finished products to a specific manufacturing technique. The first stems from the way in which artifacts such as ceramics are measured, and the lack of agreement about what constitutes "standardization". In chapter seven, the organization and grouping of rim forms for the Kaundinyapura sample ceramics were discussed, indicating some of the steps by which individual exemplars came to be grouped into formal cate-gories. As different investigators may have different standards by which "exactitude" is measured, the perception of standardization in any given assemblage may vary between researchers.

Even when standardization is perceived in the assemblage, there is no requisite link between specialist production and standardized products. Ethnographic studies of ceramic production have examined the products of specialized producers (such as full-time or part-time ceramic manufacturers) in societies where not all persons

manufacture their own pots (e.g., Longacre, Kvamme and Kobayashi 1988; Van der Leeuw, 1984). Even when specialized producers exist, some of their repertoire may consist of products which have a low degree of standardization. In their study of pots made for market by potters in the Philippines, Longacre et al. found that some categories of vessels had a very low coefficient of variability suggestive of purposeful standardization between individual potters (Longacre, Kvamme and Kobayashi 1988). The same specialized potters also produced categories of vessels, such as flowerpots, which had a very high coefficient of variability (Longacre, Kvamme and Kobayashi 1988). Thus, a high variability of vessels may obscure complex relations of production in which standardization reflects not only production capacity and organization, but consumption parameters.

Ethnographic studies in ceramic production have shown that different production strategies--such as household production, household industry and workshop production--can be active simultaneously (summarized in Sinopoli 1991). As Rice herself has commented, the links between standardization and various types of production intensity have not been studied extensively by ethnographers (Rice 1987a). It appears unlikely that the study of the artifacts themselves will be sufficient for the elucidation of the ways in which production was achieved. When only artifact fragments are available, it is particularly difficult to determine the

range of variability, as noted in the grouping of the rim forms from the Kaundinyapura survey materials where the perception of variability may be enhanced by the fragmentary quality of the artifact assemblage.

Production strategies can however be assessed through a variety of other means. One important aspect of production is the locus of production, which can be elucidated from the composition of finished products or the location of areas of production debris. Determining the locus of production from the form or quality of a finished item is often difficult. By contrast, material analyses can be instrumental in illustrating whether those products were made at a single or a variety of source locations, and whether that production locus is local or involved exchange into the site. In the case of ceramics, compositional analysis of the clay can indicate whether vessels of similar form and appearance contain a similar clay composition. When they do not, it is likely that many sources of production were in existence, in which diverse materials were utilized to produce similar-looking vessels.

The identification of the precise source location for pottery can however be extremely difficult, since clay sources are often mixed in the production process, making it difficult to trace the individual clay sources utilized in the making of a particular pot (Rice 1987a; Rye 1981). A more straightforward means of indicating local production through materials analysis can be achieved by comparing the

composition of similar forms from different sites. If similar forms contain similar chemical profiles, then it can be argued that they are all likely to come from one source. This approach has been utilized by the excavators at Sembiran, Bali, in the analysis of Rouletted Ware found there; neutron-activation analysis of eight of the Rouletted ware sherds indicated that they came from the same source (Ardika *et al.* 1993). By contrast, if similar forms contain a variety of chemical profiles, it can be argued that either the finished products or the raw materials for their manufacture emanated from a variety of sources.

A similar approach was taken from a very limited number of sherds at Kaundinyapura and Dhamantri. At Deccan College, two sherds of high-fired, well-polished ware (in the 400-type series) and a clay sample from Kaundinyapura were subjected to x-ray diffraction analysis. The chemical profiles of these three samples were similar, suggesting that this fineware was locally-produced. Additional confirmation was obtained by comparing the Kaundinyapura and Dhamantri samples with XRD profiles of wares which have an identical appearance (in finish, thickness and fineness) from Raipur, a megalithic site 80 kilometers east of Kaundinyapura (Deglurkar and Lad 1992). The results, shown in figure 10.1, indicate that some of these wares from Raipur contain a notable quantity of mica, indicative of the presence of mica in local clays. By contrast, the

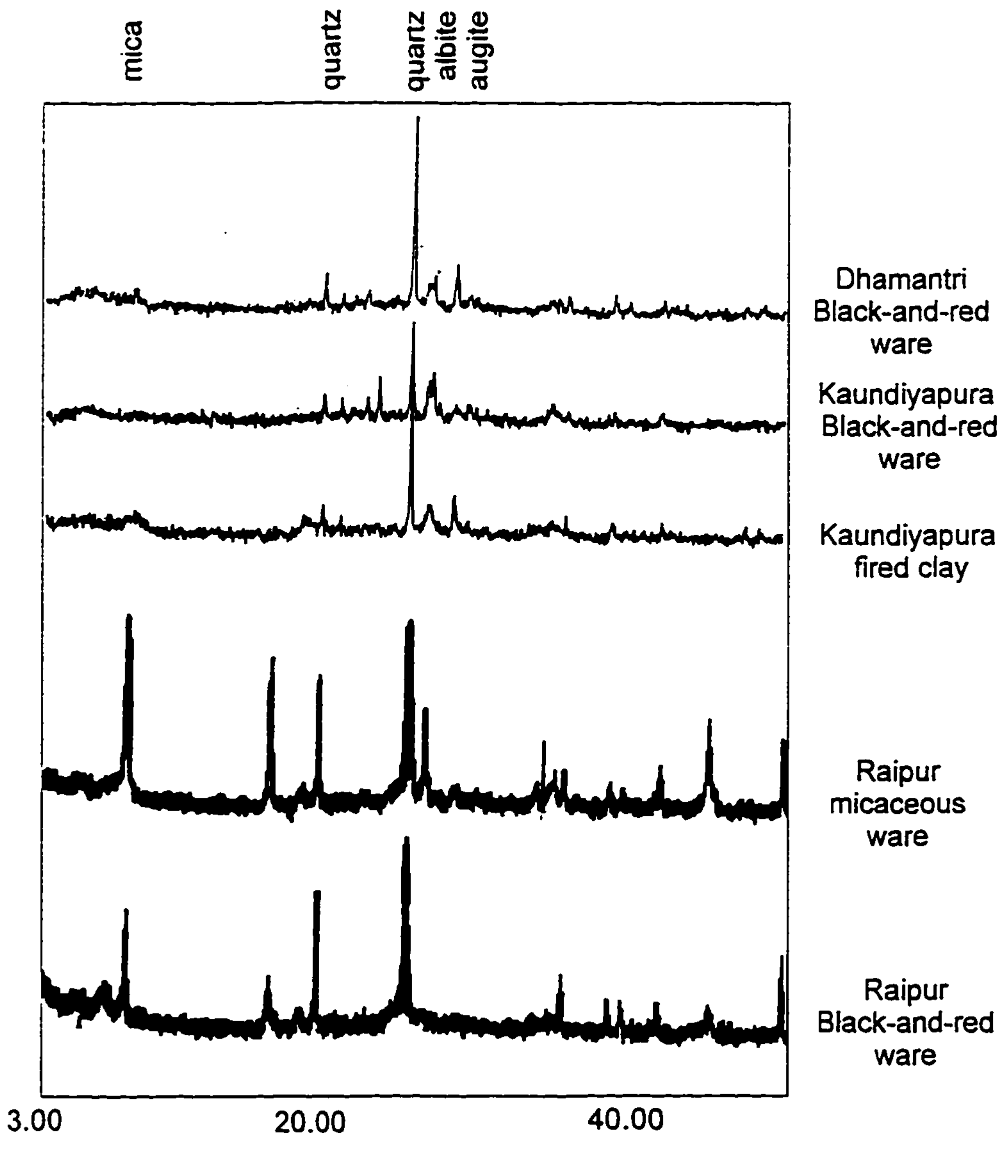


Figure 10.1. X-ray diffraction of sherds of high-polish black-and-red ware from Kaundinyapura, Dhamantri and Raipur. Analysis done by V. Gogte, Deccan College; Raipur results from Deglurkar and Lad 1992:109

Kaundinyapura and Dhamantri wares contain no mica, indicating that these finewares were locally-produced though they shared stylistic and formal similarities with wares in other parts of the region. The widespread use of similar ceramics at many sites in Vidarbha is noted in the distribution of similar rim forms throughout the Early Historic period (see Appendix C). Because clay is readily available throughout the Vidarbha region it appears logical that the majority of pottery was locally made, although some wares may have traveled as containers for other, perishable products.

Another indicator of production activities at Kaundinyapura is found in the use of chert at the site, both in the form of finished products and chipping waste. In the excavation report of the Kaundinyapura site, Dikshit suggested that "a small scale industry for the manufacture of beads existed at the site during Period IV [Satavahana, 150 B.C.-200 A.D.] evinced from the several unperforated specimens and an exquisitely worked banded agate bead which required polishing and drilling only" (1968:85). During the course of the two excavation seasons in 1962 and 1964, a total of 98 beads were recovered from the Bhim Tekdi excavations and 297 from the KDN-II excavations (Dikshit 1968:85). In addition, the excavator noted that a total of nearly 120 beads were collected as surface finds over the course of the excavation season (Dikshit 1968).

In the current survey, only a very small number of

finished ornaments were found, despite meticulous collection in the sample units and the recording of all other beads whenever they were found. The total bead count for the 1994-95 surface collection is as follows: one possible bead preform and one flat stone disk bead on the location 201 mound; one whole unperforated carnelian cylinder-bead near 203-01; and one unperforated carnelian cylinder-bead and a round crystal bead, both isolated finds on the southern flank of the KDN-II mound.

The presence of production waste at Kaundinyapura and Dhamantri is perhaps a better indicator of the production of chert objects at the site, since production waste is much less likely to be collected as curios. A total of 22 units at Kaundinyapura and 1 unit at Dhamantri had at least one chert flake, while a larger number of collection units (n=29 at Kaundinyapura; n=3 at Dhamantri) had chert shatter (a category which describes chert fragments where it could not be determined whether the fractures were caused by natural or cultural agents). In addition, 9 units at Kaundinyapura and 1 unit at Dhamantri showed cherts which had been heat-treated, an effect which may have also been due to natural causes, but is likely to have been a deliberate attempt to improve the working properties of the stone (for a distribution of modified cherts at Kaundinyapura, see figure 10.2).

Chert is locally abundant in the area, being found geologically in the interstices of basalt flows; chert

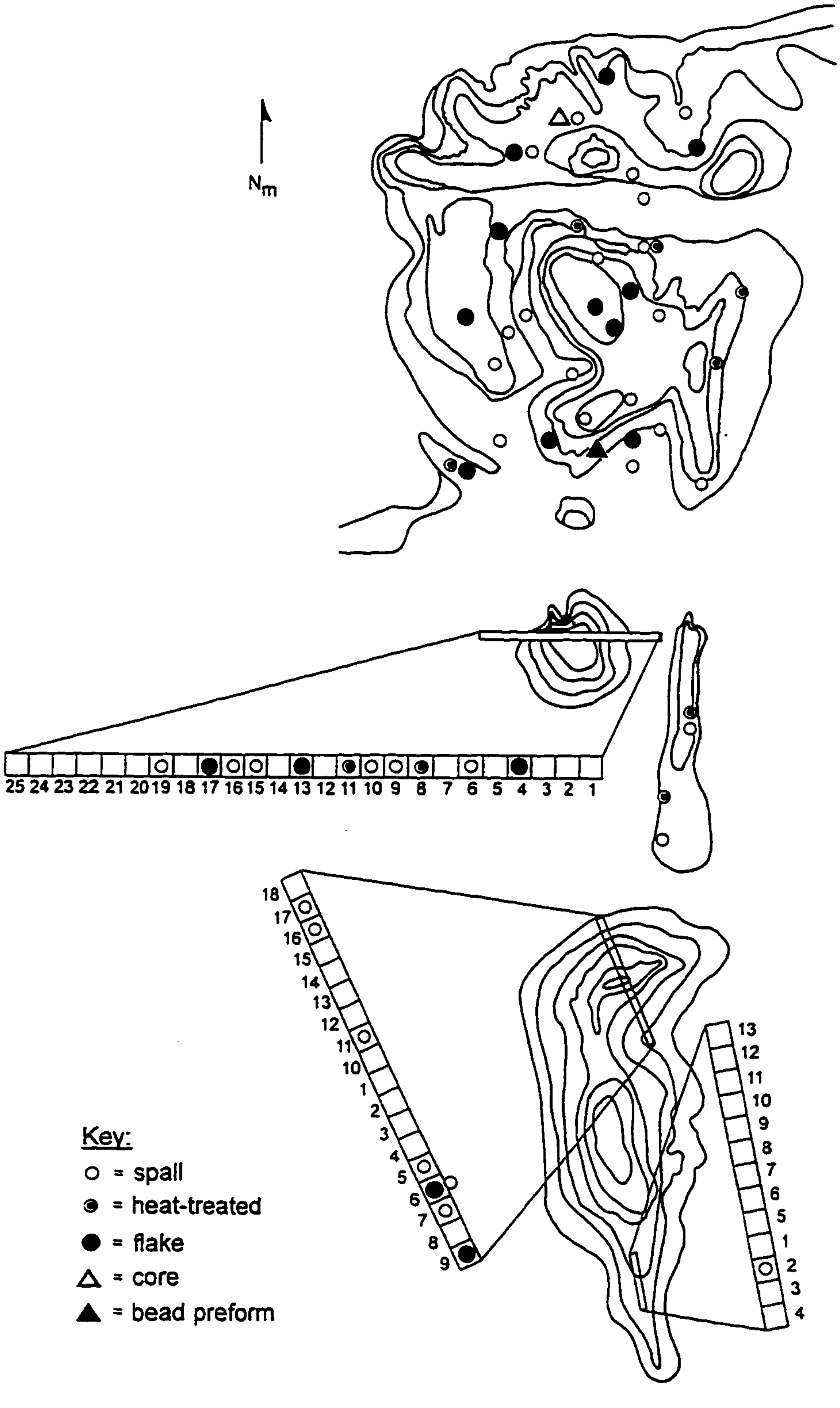


Figure 10.2. Chert flakes, chert spalls and heat-treated chert from systematic collection units at Kaundinyapura

nodules of 1-2 centimeters in size can be found in many areas of weathered basalts, such as on hillsides and embankments where streams join the Wardha river. The reconnaissance survey portion of this project also recovered one source of good-quality chert in bands up to 6 centimeters thick, at locality 27 (across the river and 5 kilometers east of Kaundinyapura). This source location is the only known nearby area which could have produced the large disks (n=3) noted by Dikshit as occurring in the Period IV levels (Dikshit 1968:85).

Another measure of local production is in the form of slag and other indicators of metal production (figure 10.3). Iron ore was recovered in small quantities in one sample unit in location 201, in one sample unit in location 203, and in four units in location 204. Iron bloom (a total of 30 grams) was recovered in two adjacent sample units in location 203. Metal slag was recovered from 13 of the Kaundinyapura units and from one of the Dhamantri units (although no ore or bloom was recovered at Dhamantri). The low quantity of such materials indicates that iron was probably not produced in the living areas of the sites, but that production debris may have been carried in as secondary building materials. Slag broken into fist-sized pieces may have served as a material for floor foundations or other levelling activities prior to construction.

Iron is plentiful in Bhandara district; the district also produces gerú (red ochre used for staining wood and

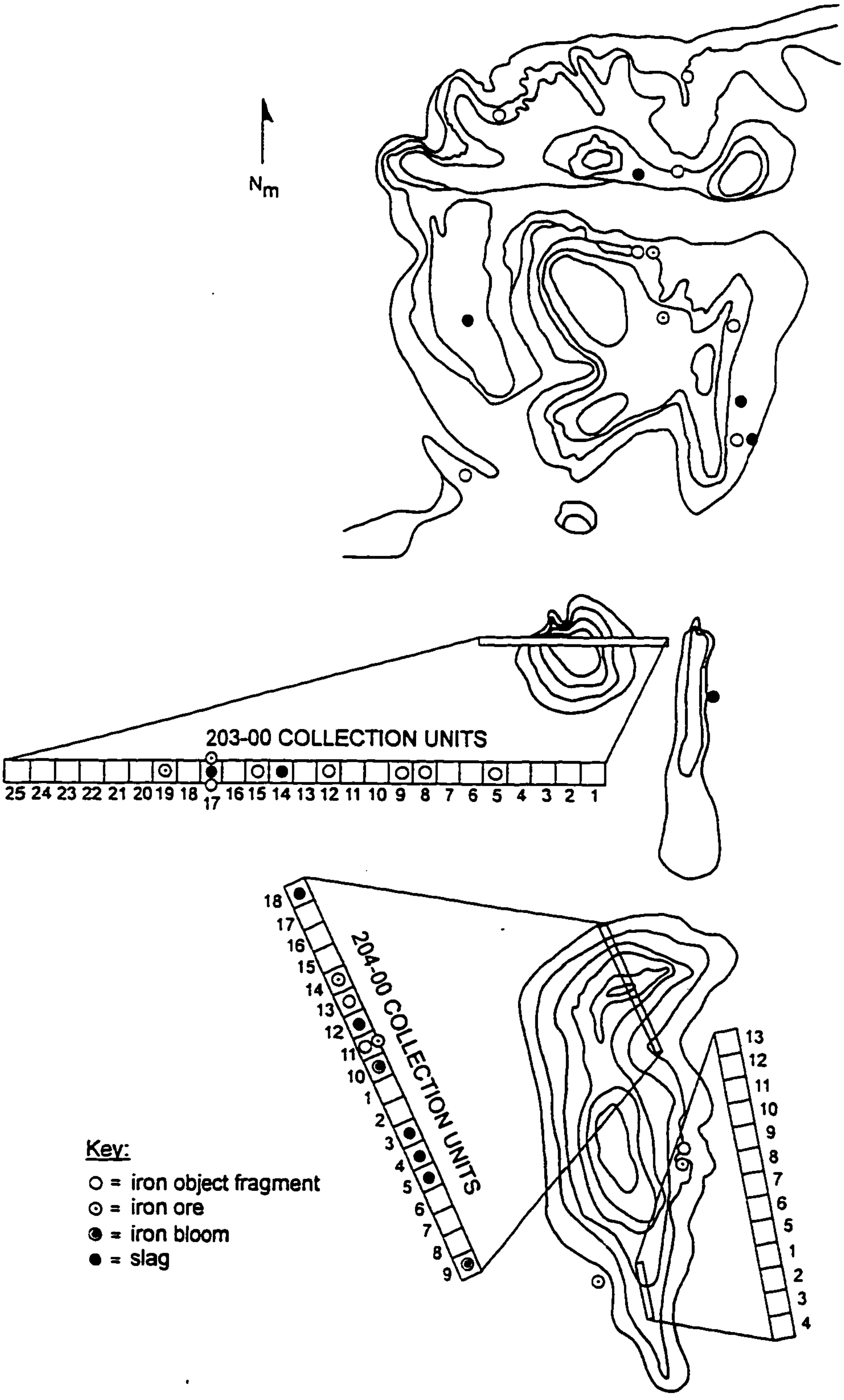


Figure 10.3 Metal slag and other metal-production indicators from systematic collection units at Kaundinyapura

dyeing cloth) from the Saletekri tract of the Balaghat district (Grant 1984[1870]). Iron ore is abundant in Bilaspur district, especially abundant in Chanda district, with a hill of iron-ore in the vicinity of Lohara, 20 miles southwest of Brahmapuri (Grant 1984[1870]). The writer of the 1882 Census of Berar noted that cookpots were mostly brought in from Nasik, and that "there are no mines in Berar, so that the raw material, for such small manufactures in iron, copper, etc., as do exist, has to come in from outside" (Kitts 1882:230).[1] Access to iron ore is very limited in the area around Kaundinyapura; in Amraoti district, it was noted that "Two small tracts of laterite are met with, one just south of Rithpur, the other about 4 miles north of Amraoti" (D.T. Blanford, Memoirs of the Geological Survey of India 1869:285, cited in Fitzgerald and Nelson 1983[1911]:9).

The evidence from Kaundinyapura and Dhamantri indicates that the production of some durable goods, such as objects of iron and chert, took place at or near the sites. The organization of production is difficult to elicit from these limited remains, though the potential for

[1]The authors of the 1911 Gazetteer for Amraoti district report that in the Amraoti hills and near Dabheri in Morsi taluk, "iron ore of laterite origin is said to be obtainable" though it is not apparently utilized; however, this report of laterite is not mentioned by any primary source so that this may be a spurious reference (Fitzgerald and Nelson 1983[1911]:272-73). Morsi is located 40 kilometers northwest of Kaundinyapura.

specialized production in iron objects is indicated in the general anthropological understanding of iron-production requiring special expertise (e.g., Tripathy and Tripathy 1994). By contrast, the manufacture of chert objects may have been performed at a low level of intensity, in which each household produced its own chert cutting-tools or ornaments.

The critical observation of the Kaundinyapura materials does not however rest in the way in which production was organized, but in the more basic demonstration that surplus production was both possible and achieved. Barbara Stark, in her essay on the identification of pottery-production locations, points out that while specialization implies exchange, it is not required for exchange to take place: the only essential element in the creation of exchange is the presence of surplus (Stark 1985). Acceptance of this observation leads the investigator away from the often-intractable question of the way in which products are generated, and towards investigating the volume of that production.

Any archaeological indicators of consumption of non-local goods prompts the identification of aspects of the physical and social environment which must have been managed as a source of surplus devoted to exchange. The archaeological evidence examined in the course of this project demonstrates that the inhabitants of Kaundinyapura in the Early Historic period were successful in acquiring

non-local goods. Determining the nature of the surplus generated in the area of Kaundinyapura requires an examination of all of the resources in the vicinity of the site, and the ways in which surplus could be generated from those resources. The natural environment around Kaundinyapura meant that several types of surplus could be achieved: the production of chert objects, the production of various types of perishable forest and agricultural products, and the use of the favorable agricultural conditions to support surplus labor in the manufacture of labor-intensive goods.

It should not be considered surprising to see different levels of production specialization at sites such as Kaundinyapura, for several reasons. First, different types of raw materials may be suited to different production strategies. Secondly, the adoption of different production strategies may also be dictated by other factors such as the economy of scale achieved when individuals specialize in different aspects of the production process. Finally, the scale of production may have altered as Kaundinyapura interacted with other sites in the larger region, including larger sites to the east such as Adam and Paunar, and smaller nearby sites such as Dhamantri. As has been observed by both ethnographers and archaeologists, specialization is not a static level of achievement, but a development which is "a process of gradual selection of (or restriction to) one occupational mode out of the

alternative possibilities presented by environmental diversity or scarcity, and the culturally conditioned perceptions of that environment" (Rice 1984:52; see also Arnold and Nieves 1992).

The distribution and quantity of waste materials on the mounded portion of the sites indicates the presence of small-scale production, perhaps on the household level, which would have produced modest surpluses. The situations of transport and population density are similar to those reported by Stark for lowland Mesoamerica, where the dispersed population and paucity of central places mean that "less specialization can be expected because less specialized producers gain a transport cost advantage over more specialized (and less numerous) producers" (Stark 1992:185). Such a situation produces particular advantages for itinerant peddlers, since "such peddlers cope with dispersed, low demand by allowing demand to accumulate between visits" (Stark 1992:185, citing Plattner 1976). As noted in previous chapters, there were a variety of merchant and consumer strategies evident in the Early Historic period, including fixed-place markets at religious and political centers as well as small-scale trade compatible with the level of small-scale household surplus manufacture.

**Local production of perishable goods**

The production of durable goods in surplus quantities suitable for trade was only one means by which the inhabitants of Kaundinyapura produced items for exchange. The natural environment around Kaundinyapura, primarily consisting of the alluvial floodplains of the Wardha valley and tropical dry deciduous forests in the surrounding hills, provided a diverse environment with the potential for abundant subsistence in the form of both wild and domesticated resources (see figure 6.2). The abundance of edible resources could be managed for direct export, or could be utilized to support craft specialists whose labor could then be devoted to producing goods meant for exchange. Both domesticated and wild resource availability can be discussed with reference to historical and archaeological evidence. Here, the discussion of domesticated plant resources will be followed by an examination of wild resources and the relationship between the two types of perishable resources.

One means of examining the agricultural products of the area for the Early Historic period is through the use of paleobotanical evidence. Such evidence is often available for the Early Historic and Chalcolithic periods in India, though subject to some limitations due to the methods of recovery. In general, botanical evidence from archaeological sites is limited because only some of the

plants utilized will be represented in the archaeological record. The representation of different species may be further dependent on the context excavated (e.g., trash middens, domestic architecture, or storage areas). Moreover, the presence of any particular botanical item will only indicate that it was consumed or stored at the site, not that it was produced at the site.

The way in which botanical evidence is recovered also will affect the extent to which archaeological deposits will represent plants utilized at the site. The most comprehensive method of recovering botanical data is through the use of flotation. When flotation is not utilized, the recovery of archaeobotanicals is often only possible when caches of burnt grain are recovered. This kind of opportunistic recovery also tends to favor larger types of seeds which are more highly visible.

The botanical remains from the Early Historic period levels at Kaundinyapura were recovered opportunistically in the course of the excavations of the 1960's (Dikshit 1968; Vishnu-Mittre 1966). Table 10.1 lists the four species known at the site; of these, only one is a wild resource (*Zizyphus nummularia*).

| | |
|---|---|
| *Lens esculenta* | lentil |
| *Oryza sativa* | rice |
| *Pisum arvense* | pea |
| *Zizyphus nummularia* | ber |

**Table 10.1. Species represented in paleobotanical remains from Kaundinyapura (adapted from Vishnu-Mittre 1966)**

To broaden the picture of cultigens known in the Deccan in the Early Historic period, a list of species recovered at other sites in contexts dated up to 200 A.D. can be constructed. Table 10.2 lists the species recovered from other archaeological sites of central-western India located in an environmental and soil regime similar to that found at Kaundinyapura. By constructing a table such as this, it is possible to list both the wild and domesticated species which were known and utilized in the Early Historic period in this part of the subcontinent. A distillation of the most common botanical occurrences can be found in figure 10.4. This chart lists all of the species which appear in 3 or more sites in the Deccan, and of these, only one (ber, the fruit of the Zizyphus tree) is a non-domesticate. The presence of a variety of domesticates serves as the basis for looking at the potential yields of the various species.

The presence of the same suite of crops is noted archaeologically at many of the sites of Vidarbha. At the chalcolithic site of Tuljapur Garhi (Amravati District),

| | Plant name | Number of sites |
|---|---|---|
| ● | *Acacia arabica* | 1 |
| ● | *Acacia cf. nilotica* | 1 |
| | *Androgon sorghum* | 1 |
| | *Cajanus cajan* | 4 |
| ● | *Carthamus tinctoris* | 1 |
| ● | *Chenopodium cf. alban* | 1 |
| | *Cicer arietinum* | 6 |
| ● | *Coix lachryma* | 1 |
| | *Dolichos biflorus* | 3 |
| | *Dolichos lablab* | 4 |
| | *Eleusine coracana* | 1 |
| | *Eleusine Gaertn.* | 1 |
| | *Hordeum vulgare* | 7 |
| | *Lathyrus sativus* | 5 |
| | *Lens esculenta* | 5 |
| | *Linum usitatissimum* | 1 |
| | *Oryza sativa* | 8 |
| | *Paspalum scrobiculatum* | 2 |
| | *Pennisetum typhoides* | 1 |
| | *Phaseolus aureus* | 2 |
| | *Phaseolus mungo* | 2 |
| | *Pisum arvense* | 5 |
| | *Pisum sativum* | 1 |
| ● | *Ricinus communis* | 1 |
| | *Sorghum sp.* | 4 |
| ● | *Terminalia belerica* | 1 |
| | *Triticum sp.* | 8 |
| | *Vicia sp.* | 2 |
| | *Vigna mungo* | 3 |
| | *Vigna radiata* | 1 |
| ● | *Zizyphus sp.* | 8 |

● = WILD

Table 10.2 Botanical species recovered from archaeological sites in the Deccan region of west-central India

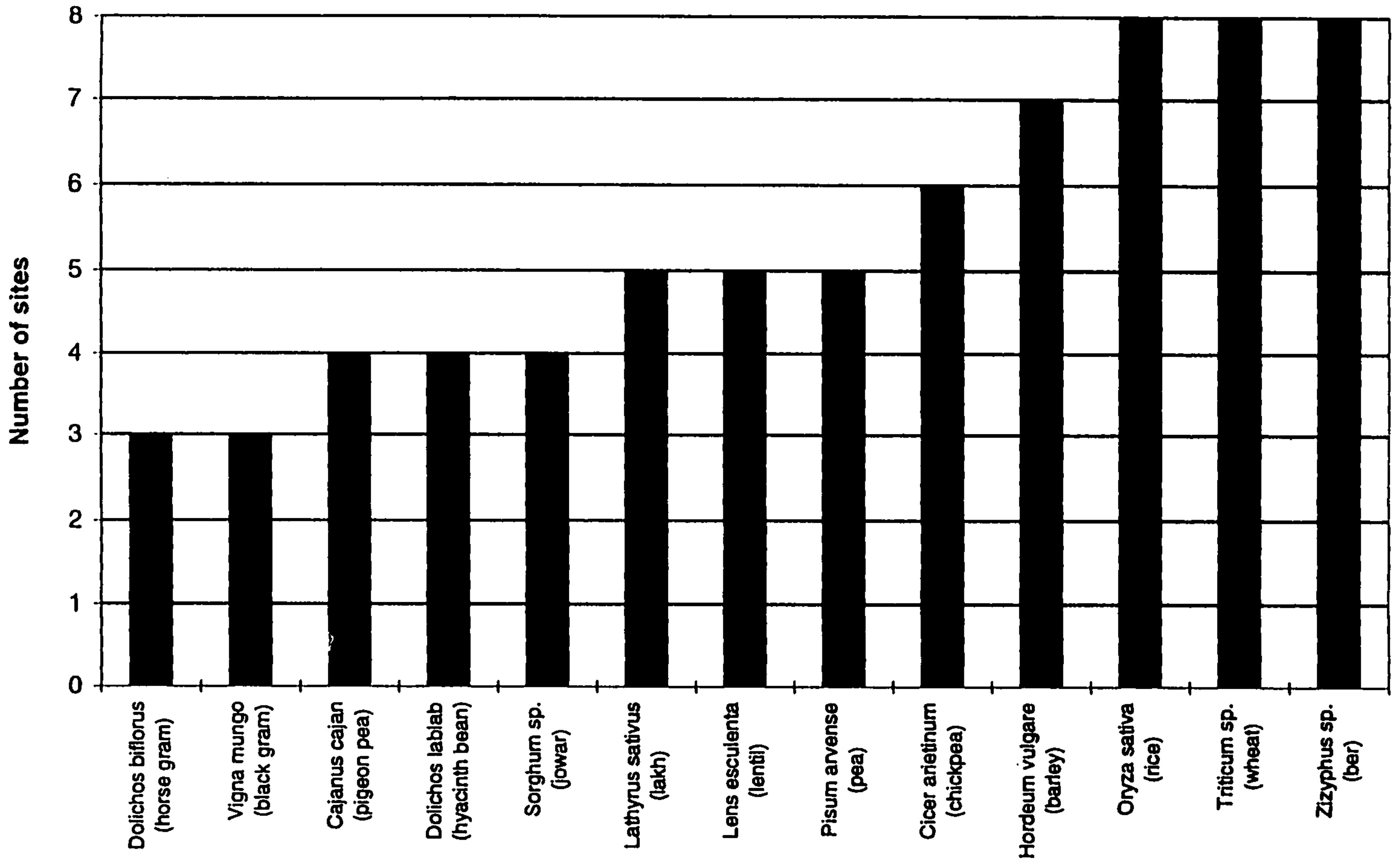


Figure 10.4. Most common paleobotanical finds in sites of the Deccan, listed by frequency. A total number of fourteen sites in the Deccan yielded paleobotanical remains

the remains of both winter crops (wheat, barley, lentil, grass pea, gram) and summer crops (rice, great millet, hyacinth bean, horse gram, black gram, green gram) were recovered (Kajale 1988). The botanist concluded that this evidence indicates double cropping in the area of Vidarbha in the chalcolithic period, an indication also confirmed by the mixture of summer and winter crops at the megalithic site of Bhagimohari (dating 800-400 BC; Kajale 1988). Although the presence of these crops does not mean that all of these cultigens were actually grown in the area of the site, it does show that this range of crops was present in the Vidarbha region and that the consumption of these crops was known.

Documents from the nineteenth century provide indications of the yields which could be expected from some of these crops, prior to the advent of modern techniques such as pump irrigation and fertilizer. Colonial-period documents should entail some caution in their use, as compilations of records were rarely undertaken for the sake of pure knowledge. Historical documents are not statistical selections of the past but instead were created with particular emphases, often written from the point of view of elites or in the case of colonial documents, often with a view towards managing economic activities (Trigger 1978; Wilson and Rogers 1993).

Official tallies such as census records and agricultural yields were done for administrative needs such

as the assignment of taxes. Other studies such as biological or agricultural studies were done with the intent of improving yields for the sake of colonial governments. And the interpretation of the numbers given for crop yields needs to be undertaken with caution: figures may be inflated by desires to emphasize the positive, or may be underreported by local landowners to decrease the tax assessment. The realities of administration meant that the sample for any given district by a census officer might also be biased towards fields handily near the district headquarters (an admonishment made by Carey 1898:26).

However, early modern documents do provide critical information about other aspects of the premodern landscape, such as forest coverage, the areas suited for the production of particular crops, and yield figures for those crops. Figure 10.5 indicates all of the available wheat yields from the areas around the site of Kaundinyapura (which is located on the administrative dividing line between Amravati and Wardha districts). The disparity between the highest and lowest reported yields is considerable, where the highest yield per hectare is nearly six times the lowest reported yield. The range of variation in yields varies by year, and not necessarily by region; for example in figure 10.5, a number of different data points come from the area of Wardha district. The figures for the production of gram are even more dramatic,

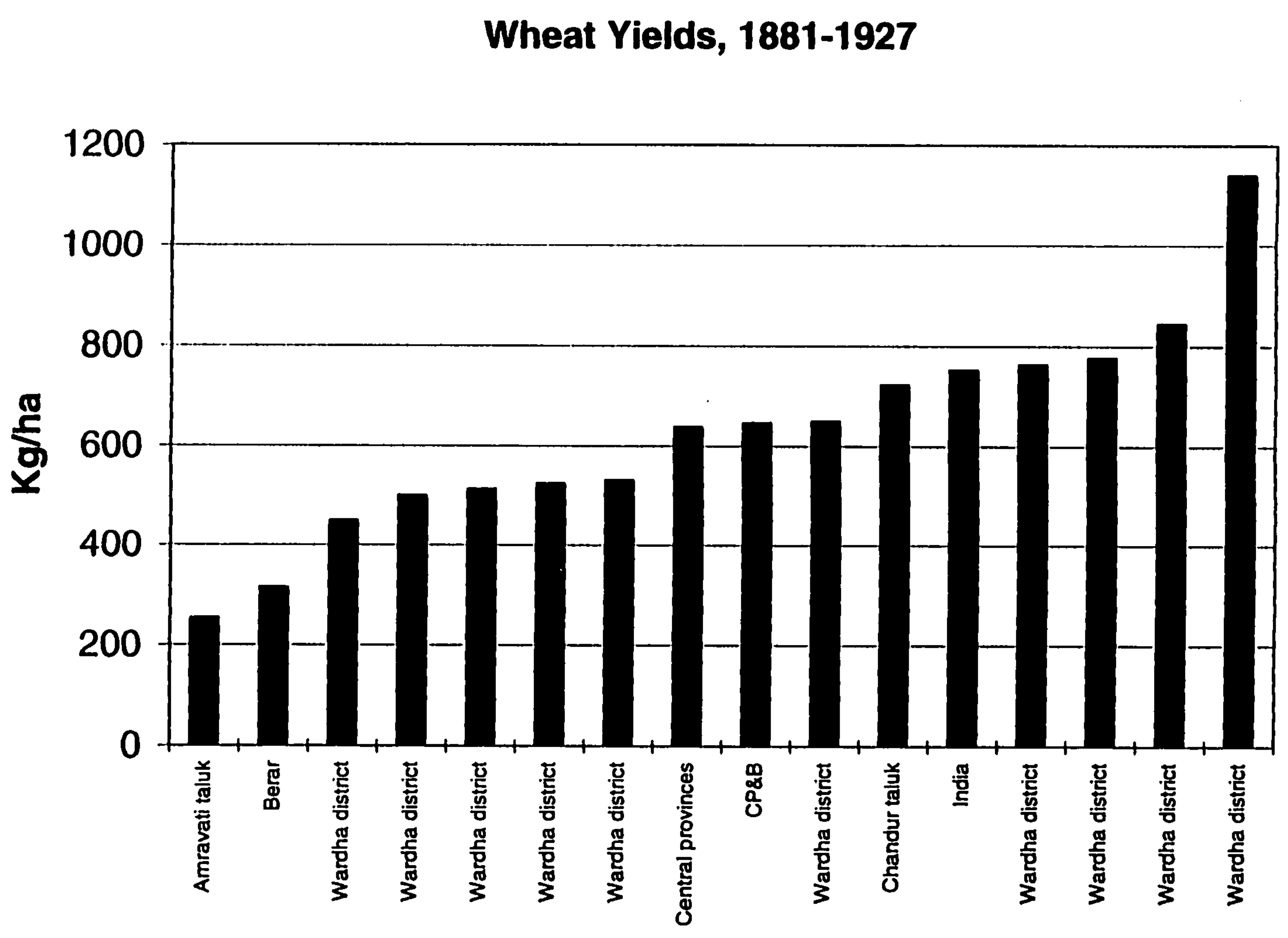


Figure 10.5. Comparative wheat (*Triticum* sp.) yields for the area around Kaundinyapura, based on agricultural yield records from 1881-1927

with the highest yields more than seven times the lowest yield (figure 10.6). The figures for other domesticated crops show a similar fluctuation between years of high and low production, so that in any given year a particular area will produce an abundant crop and in other years it will not. The reason for the variation is due to two principal factors: pests and annual rainfall, the majority of which falls as the summer monsoon (Dikshit 1986). Figure 10.7 illustrates this annual rainfall regime for eastern Maharashtra. The importance of the summer monsoon is also illustrated in the interaction between rainfall and soil moisture, in that the seasons before and after the summer are seasons of water deficit (see figure 10.8).

However, variations in rainfall are not universally devastating, since by double-cropping, farmers can compensate for crop shortfalls in one season by planting a different crop mixture in the following season (Carey 1898). Some plants, such as millets, are particularly hardy and will produce a reasonable crop even under drought conditions (Carey 1898). The achievement of an agricultural subsistence level is not merely a question of yields, but also involves choices actively made in response to favorable and unfavorable environmental changes from one year to the next.

Early modern documents provide a more detailed examination of the complex interrelationships between environmental variation, crop choice, and labor allocation.

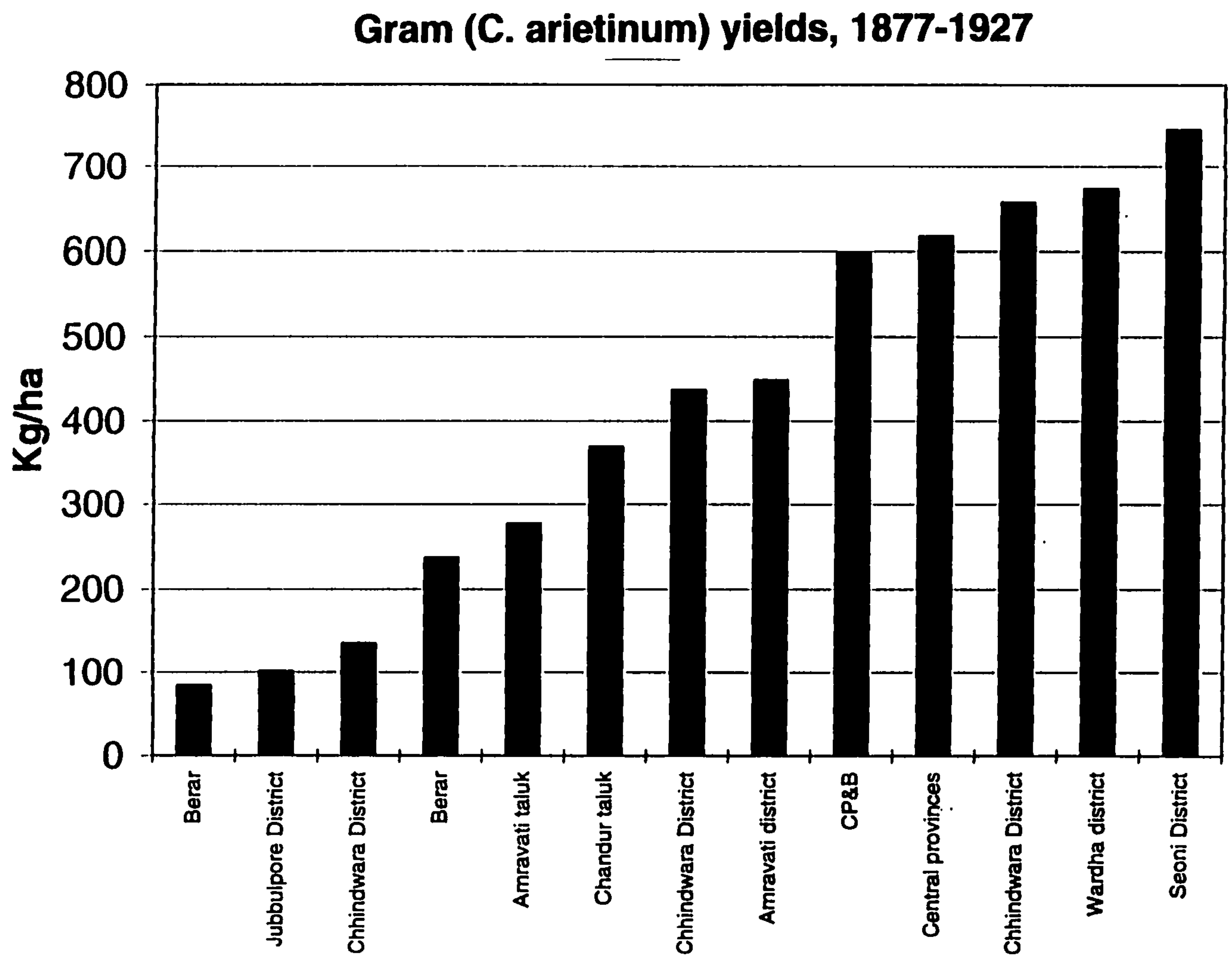


Figure 10.6. Comparative gram (*Cicer arietinum*) yields for the area around Kaundinyapura, based on agricultural yield records from 1877-1927

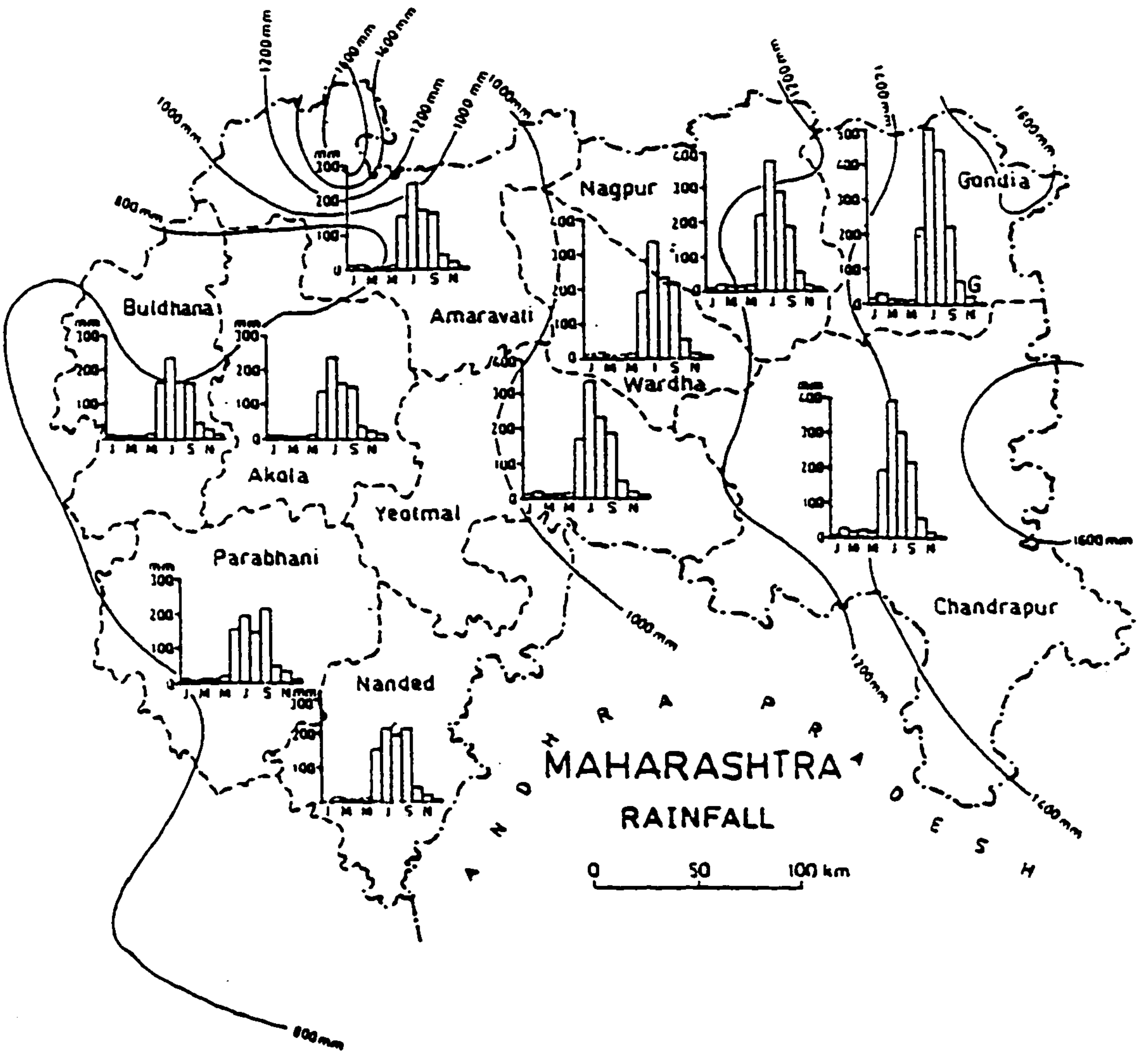


Figure 10.7. Rainfall regime in eastern Maharashtra (from Dikshit, 1986: figure 10)

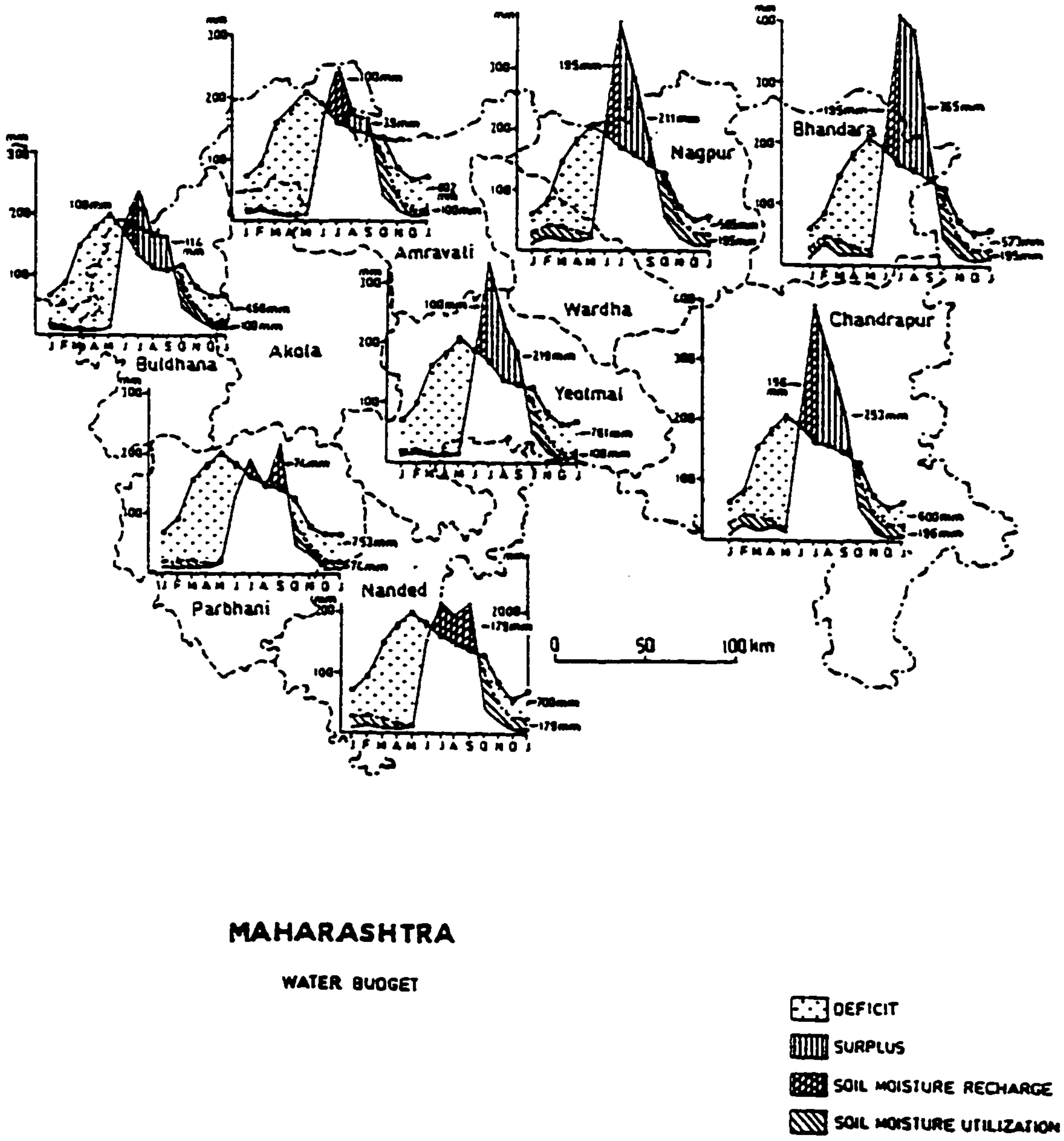


Figure 10.8. Rainfall-soil moisture interactions in eastern Maharashtra (from Dikshit, 1986: figure 11)

A summary of crop conditions from 1890 to 1898 indicates the way in which weather conditions differentially affected crops. While conditions in 1892-93 led to satisfactory winter and summer crops, rains in the following year destroyed the ripening kharif (summer) crop and produced rust in wheat and linseed:

> In that year the wheat crop of Saugor and Damoh was practically a total failure, and very material damage was caused by fungoid disease in other districts, both to wheat and to linseed. In the subsequent year meteorological conditions were decidedly similar. Cotton and til were much injured, while the wheat crop in Jubbulpore was wiped out...then followed the year 1895-6, which ushered in the period of drought that culminated in the great famine from which we are now emerging. In that year the rice crop suffered very severely, but the circumstances were not on the whole unfavourable to staples such as cotton, til and juar... (Carey 1898:1-2).

Shifts in annual rainfall can have a greater effect on some parts of the country than others. Carey notes that in heavy rainfall in the autumn months of 1894 caused considerable damage to the rice crop in the Wainganga valley, Damoh and Jubbulpore, but that the yield was "full" in Chhattisgarh; in the following year, the first year of drought after three years of excess rain brought a good outturn of the early-ripening varieties of rice in some districts while yields in other districts were one-quarter to one-half of normal (Carey 1898:8).

In addition to droughts and crop diseases, there are other threats to agricultural crops, in the form of "rodents, blackbuck (and other herbivores), weeds, seasonal

fodder shortages for working cattle, and soil deterioration in the form of water run-off and erosion" (Ratnagar 1989: 298). Agricultural pests may be specific to particular crops, as noted for the harvest of gram in the late 19th century: "Excessive moisture and clouds induced a veritable plague of caterpillars in 1894-95, and in 1895-96 great losses were occasioned by the drought" (Carey 1898:15). Weather fluctuations and pest problems both caused agriculturalists to change their crop types in response; for example, Carey notes that in the "years of excessive moisture, 1893-94 and 1894-95, cotton lost in popularity ...the rice area has not varied greatly, but the more cheaply sown crops, such as juar, gram, kodon and til have to a great extent replaced wheat and linseed which have suffered so greatly from fungoid disease" (Carey 1898:3).

Although there are many factors which affect crop productivity, there are also a variety of strategies to mitigate the effects of potential crop failure. These strategies include increasing crop diversity or domestic-animal diversity, storage of foodgrains, and increased reliance on wild resources. Besides these in-place adaptations, there are responses which appeal to outside sources of subsistence, including outright migration from the stricken area and trade of surplus non-comestibles to outside agents in exchange for food.

Symbiotic relationships between herders and farmers are also documented in the historic and ethnographic

record. In some cases this involves the exchange of animal products for agricultural products; in other cases, members of agricultural households can be delegated to take up other tasks such as herding (Murty and Sontheimer 1981). In the southern Deccan, Murty examined the Kuruva and Golla peoples, who "have a symbiotic relationship with the peasant communities: they pen their sheep herds in the fields (the droppings are used as manure) before the sowing season for which they get returns in cash or kind" (Murty, 1993:33-4). This interaction is a response to the mosaic of different habitats which comprise west-central India, where the availability of resources "would change due to the intense seasonality and inherent variability in climate so typical of the Deccan" (Rodgers, 1991:198).

The variety of potential and interacting responses to environmental shifts is indicated in figure 10.9. Note that these are decisions which can be made at the time of food stress--there are also long-term planning responses such as storage which buffer any negative environmental shifts. Thus, the evidence from historical documents indicates that the choices of resource procurement are even more complex than records of yields and distribution would suggest. A level of subsistence could therefore always be maintained by both long-term and short-term strategies. I would like to propose that these complex strategies were utilized to maintain a level of subsistence calculated in both biological and social terms, where the maintenance of

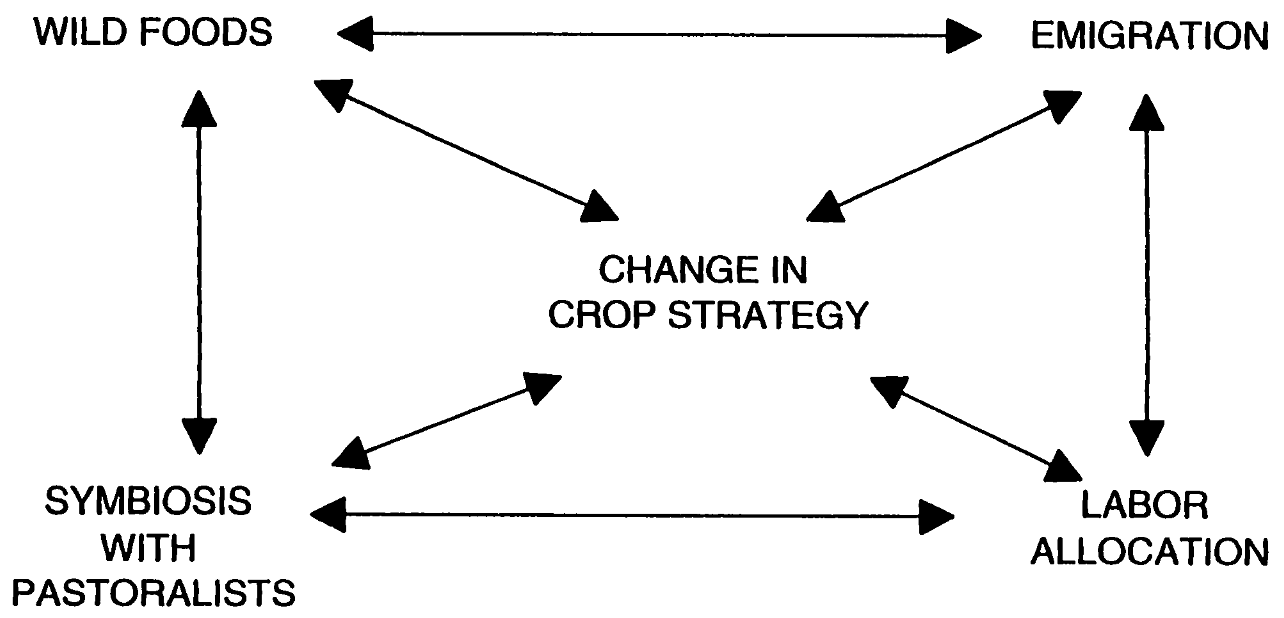


Figure 10.9 Potential responses to environmental fluctuation and food stress

a tradable surplus was a critical factor in the "social subsistence" of households.

### The exploitation of forest products

Wild resources were not merely a failsafe in times of hardship, but performed an active role in generating a surplus destined for trade. The documents of the nineteenth century list a number of wild plants, utilized for fodder or for human consumption in times of scarcity (see Fitzgerald and Nelson 1983[1911]). Forest areas also contained numerous wild animals, some of which may have been hunted for their meat or skins.

In the nineteenth century, there was active use of many of the products of the forest. The author of the 1870 Gazetteer observed that the Central Provinces area exported raw and manufactured lac, "spices and groceries", silk cocoons, and dyes (Grant 1984[1870]). A summary of the species present in the Amaravati and Wardha districts, and their uses as noted in the documents of the nineteenth and twentieth century, are listed in Appendix E. In comparison with table 10.2 which lists paleobotanical finds, few of the species known to have been used ethnographically are seen in the archaeological record. This is due to factors of preservation, but also the possibility that the processing of these resources may have taken place away from the habitation area. The uses of plants presented in

Appendix E indicate three important categories of perishable products extracted from wild resources: famine foods, fodder, and products such as waxes, gums and resins.

The presence of many different types of famine food (to be eaten in times of scarcity) indicates the potential for agriculturalists to mitigate food shortages through an increased reliance on wild resources in times of scarcity. Added to the many other strategies for coping with agricultural shortfalls, the presence of wild resources would have enabled the agriculturalists of the Wardha valley to maintain considerable self-sufficiency in resources. Again, however, the presence of non-local goods at the sites of Kaundinyapura and Dhamantri is a reminder that self-sufficiency was not considered the adequate minimum threshold of production.

The use of forest resources was an important component of the production of surplus for exchange. One way in which this was managed is through the use of forest areas and marginal agricultural lands (such as those in the scrub hills to the west of Kaundinyapura) as zones for domestic animal production. The management of goats, sheep and cattle can result in the production of meat, milk, traction, and hides. While highly-perishable goods such as meat and milk were probably not an object of exchange, animals raised in the Kaundinyapura area could have easily been transported to other sites in the region. Many

different types of trees in the Amravati and Wardha areas produce bark suitable for tanning (e.g., *Acacia leucophlaea, Acacia nilotica, Anogeissus latifolia, Cassia auriculata;* see Appendix E). The collection and shipment of these products, or the production of leather goods from locally-raised animals, may have been an important component of Kaundinyapura's economy.

Also noted in Appendix E is the range of forest products such as gums, resins, and dyes which can be extracted from forest resources. These goods can be collected and exchanged as raw materials, but can also be invested with additional labor processing to produce finished products. Animals were also available for hunting, in much larger proportions than can be imagined today, when there is considerably less forest cover. This depletion of fauna was quite rapid; already in 1908 the authors of the Imperial Gazetteer noted that in the Amravati district, game was "less plentiful than formerly" with tigers being now rare though leopard, wild hog, spotted deer and nilgai were noted as "not uncommon" and antelope were plentiful on the plains (His Majesty's Secretary of State 1908:307).

## Modes of Transport

The way in which goods and people were transported in the subcontinent in the Early Historic period can be

assessed through a variety of sources. Documents of the period give relatively little information, but the iconography of temples, such as at Sanchi, indicate that animal-drawn carts were known and utilized. Another rich source for logistical information is provided by 18th and 19th-century texts which describe the specific challenges of the landscape of central India.

The summer monsoons make travel difficult, rendering dirt roads and pathways impassable--a fact particularly noted by the early British travelers in this area (e.g., Grant 1984 [1870]). Early writers described the modes of transport utilized prior to the railway, which continued to flourish in areas lacking rail transport. The author of the 1911 census noted that the rice-growing areas of the Central Provinces and Berar had been especially difficult of access, with the only means of transport of surplus produce being "through the agency of the Banjaras, whose caravans of pack-bullocks carried rice and millets to the more advanced tracts of the Nagpur district and the districts of Berar..." (Marten 1912:16). Cotton was also transported by pack-oxen, where a standard bullock-load weighed 250 pounds (Fitzgerald and Nelson 1983[1911]).[2]

[2]The inefficiency and awkwardness of this mode of transport is hinted at by one General Balfour, writing around 1847: "The cotton is eaten by the bullocks, stolen by the drivers, torn off by the jungles through which the road passes and damaged by the dust and the weather as well as having to be loaded and unloaded every day often in wet and mud" (cited in Fitzgerald and Nelson 1983[1911]:248).

Rivers serve as both barriers to transportation and as transportation routes (cf. Deloche 1980). There is little information about the use of boats on the large inland rivers of the subcontinent, but historical documents indicate the use of rivers as a means of conveying goods. The 1911 Gazetteer cites the use of the Tapti river, formerly "used by the jungle people to provide cheap transport for their timber to Burhanpur" (Fitzgerald and Nelson 1983[1911]:3). Overland travel was most likely to be done on foot, with oxen bearing loads, rather than by cart as the "roads" were really tracks, impassable during bad weather and completely unusable during the monsoons. Colebrooke speaks of oxen loaded with grain (especially linseed, sesame, and wheat) seen at different points of his journey from the Ganges, noting the grain trade by cart from Nagpur to Chattisgarh. Other authors indicate that cotton was transported by ox-load (Colebrooke 1790; Fitzgerald and Nelson 1911).

Political factors also affected the routes of trade, and were less predictable than the weather. Speaking of the route which he took from Mirzapur on the Ganges to Nagpur, Colebrooke notes: "For a short time preceding and following the season in which we travelled, the traders, who exported silk, spices, and other valuable merchandise to the Dekhin [Deccan], followed the same track, which we pursued. But commerce is now returning to the shortest and more convenient route of Baghelehand" (1790:65).

## Routes of transport

The routes of transport in central India are principally limited by season rather than by geography. Some geographical limitations exist to the north of the area which would have affected the movement of peoples into central India; for example, the Tapti river is a formidable barrier, with only a few crossing points which correlate with significant archaeological settlements such as Tripuri.[3] However, the area of Vidarbha is quite easy of access in the dry season, with even major rivers such as the Wardha being fordable at many places. The compilers of the 1908 Gazetteer note that the Wardha river is navigable during the monsoon months as high as Rattegong, but that it is "generally fordable in all seasons" (His Majesty's Secretary of State 1908:710). Other writers of this period also note that the chief limitation to travel in this region is due to the monsoon.

Some indicators of the rigors and routes of travel prior to modern transportation are found in nineteenth-century sources. The railway which was constructed in 1867 to ship cotton from the Nagpur area to the port at Bombay was a new route established by colonial interests; documents of the period indicate that the old cotton trade route went from the Wardha valley north to Mirzapur, and

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[3] I am indebted to Shereen Ratnagar for this observation (pers. comm.)

from there down the Ganges (Colebrooke 1790). Later, this route was shortened to make use of the Mahanadi river which brought the cotton to the east coast port of Cuttack (Grant 1984[1870]). Perhaps under the influence of the British activity in Bombay, by the late 1840's observers estimated that a greater part of the cotton which was transported went to the west coast (Fitzgerald and Nelson 1911: 248). In the eighteenth century, early European travelers to the Nagpur area noted that there were routes from Nagpur in all directions except for the southeast; at the time, this was interpreted to be the result of that particular area being uncultivated and unpopulated (Rennell 1976[1793]:282).

The routes chosen by travelers emphasized safety rather than efficiency. H.T. Colebrooke, writing of his journey in 1790 from the Ganges valley to Nagpur, described the encounters made with other travelers:

> At Heriherpur, we met a numerous band of travellers preceeding (sic) to Benares. We had already met several other parties in different places. They were mostly pilgrims from various parts of the Mahratta dominions. The insults and even personal danger, to which travellers were at this time exposed on all the other routes from the Dekhin to Benares, compelled the pilgrims to choose this road, which is secure, though, every (sic) circuitous and inconvenient (Colebrooke 1790:38).

His sentiments were echoed by another early traveler, Thomas, who described the difficulties of passing through forests and the concern about attacks by wild beasts (Thomas 1782).

**The import of perishable goods into the Kaundinyapura region**

The discussion of perishable goods in the preceding sections have emphasize such goods as a means by which Kaundinyapura produced a surplus for exchange. In addition to the importation of durable goods such as sandstone and mica documented archaeologically for this area, there is also the possibility that edible commodities such as rice were also imported into Kaundinyapura. Table 10.1 shows that one of the cultigens located in the paleobotanical materials from Kaundinyapura is rice. However, at no time in the modern period has rice been grown in this part of the Wardha valley. Instead, the areas known to grow rice were in the Chandrapur and Bhandara districts, to the southeast of Kaundinyapura and also located in the same geological belt in which sandstone is available (Graham 1913-14).

The potential for the transport of food such as rice further indicates that the inhabitants of Kaundinyapura were integrated with neighboring communities in a cultural system in which shared foods (along with shared domestic goods) signified the participation in a common tradition. The social significance of rice in the subcontinent is clear in modern times, and fulfills an important role in both ritual and domestic contexts (e.g., Dhavalikar and Possehl 1974). The potential that shared foodways were an

important component of social structure in the Early Historic period is a subject worthy of future investigation through both archaeological and literary studies.

Other perishable goods such as salt probably also formed a part of the Early Historic trade network in this area. Grant mentions that in the areas of Berar next to western Chanda, there is a salt-bearing stratum into which wells are sunk for the extraction of brine to be made into salt (Grant 1984[1870]:xlv). The writers of the 1911 Gazetteer for Amravati district mention that salt-making had previously been known in the Daryapur taluk, where brackish water could be turned to salt (Fitzgerald and Nelson 1983[1911]:272-73). They also cite the report by the geologist L.L. Fermor, who indicates that "over a wide tract on each side of the Purna river, north of Akola and thence eastward towards Amraoti, wells are specially sunk for obtaining common salt from highly saturated brine" (cited in Fitzgerald and Nelson 1983[1911]:8). Grant mentions that salt is the most precious commodity brought into the Central Provinces generally (Grant 1984[1870]). This may be the reason why, even though salt was apparently produced in the Chandrapur district (about 100 kilometers southeast of Kaundinyapura), salt continued to be imported from elsewhere.

## Summary

The summary of the interactions of perishable and non-perishable goods which moved into the area of Kaundinyapura in the Early Historic period is shown in figure 10.10. This indicates the direction of various goods which would have been been imported into the site, including salt, sandstone, iron, rice, sugarcane. Goods moving out from the Wardha river valley would have included the following: cotton, wheat and other grains, beads, lac (raw and manufactured), dyes, red cochineal, gum, wax, honey and other forest derivatives such as medicines and famine foods.

As shown in nineteenth-century documents, the Wardha valley area was capable of producing considerable surpluses from the rich band of alluvial soils flanking the river. In the Early Historic period, surplus food could have been exchanged, but could also have been utilized to support non-agricultural specialists employed in manufacturing objects from local raw materials or in gathering wild resources. The presence of non-local goods at Kaundinyapura indicates that the site was part of a trade network; the distribution of those non-local goods indicates that this trade network was a vital part of everyday life in the Early Historic period.

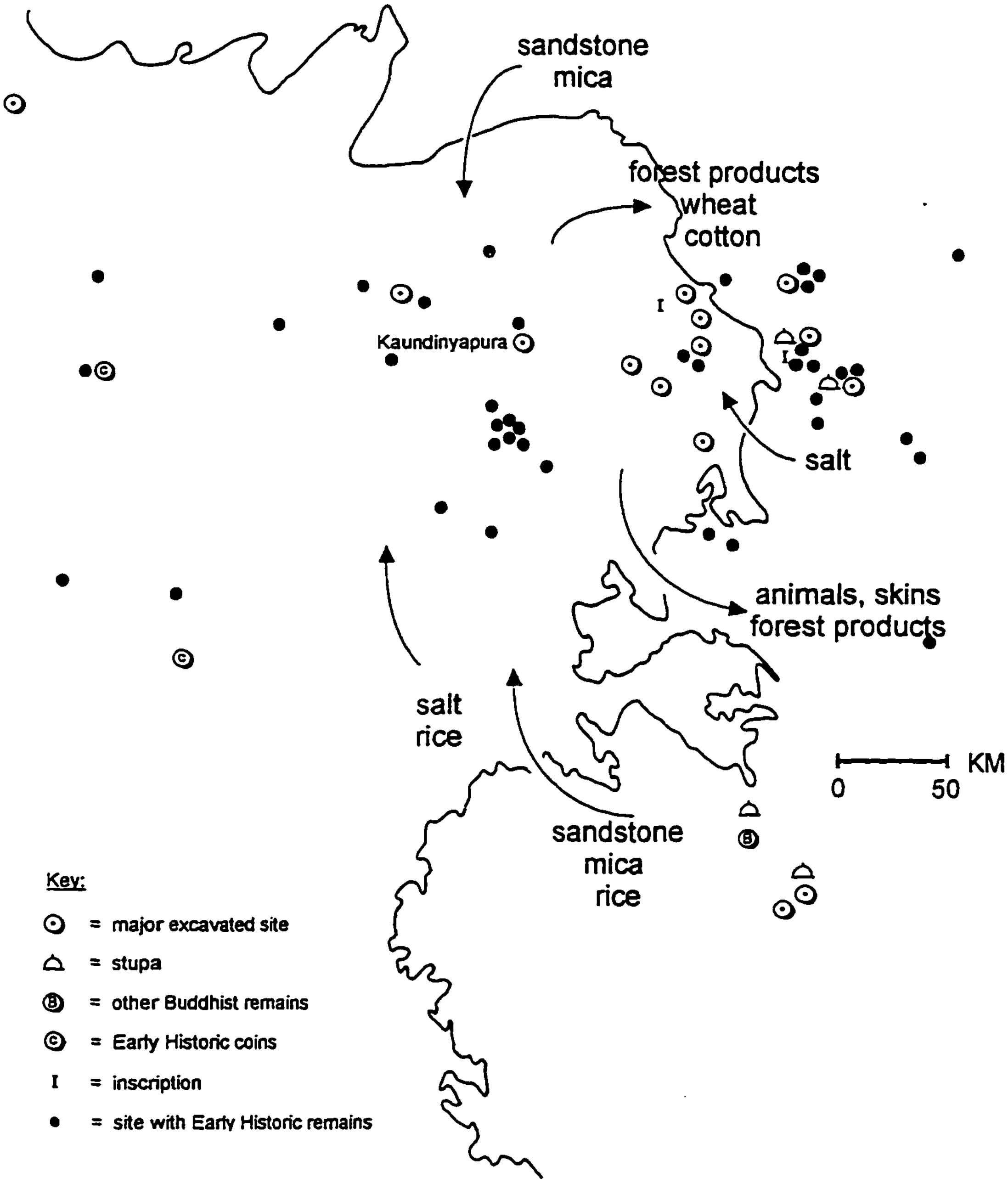



Figure 10.10. Exchange goods in the area of the greater Wardha valley in the Early Historic period

# CHAPTER XI

# CONCLUSIONS

The large-scale socio-political phenomena of the Early Historic period in the Indian subcontinent, such as the development of Buddhism and the long-distance exchange networks of the Indian Ocean, were predicated upon many local spheres of interaction. These local spheres of interaction provided transport and communication networks which served as the conduits for large-scale cultural and economic interactions during this period. But the development of the infrastructure of exchange was based upon local needs, in which the impetus for interaction was centered upon the requirements of subsistence and kinship.

The social and exchange network of Kaundinyapura and its environs was one of many regional systems in the Indian subcontinent in which common traditions formed the social background of interaction. These traditions were framed by a common material culture, as seen in the corpus of everyday objects which are consistently found in sites of this period throughout the Vidarbha region. These objects had many roles, and were valued for their serviceability in performing certain tasks as well as being invested with social symbolism. The idea that ordinary domestic goods

were invested with meaning is evident in the placement of such goods in funerary contexts: megalithic burials, beginning in the early first millennium B.C., included a variety of goods such as pottery, sandstone grinding tools, and agricultural implements. These same goods are also found in the excavations of households, and their inclusion with the dead confirms that material goods were a means of identifying individuals and their position in the social sphere. In the following centuries, the use of these objects continued, and their presence in areas outside the geographic source of supply indicates continued ties between regions.

In the early centuries A.D., the expansion of smaller-scale polities, with accompanying demographic and military movements, contributed to a social landscape in which travel was undertaken not only by traders, but also by many different types of people who traveled for religious pilgrimages, military activities, and family relationships. Interactions between people were facilitated by the manipulation of the physical world to include familiar elements; the utilization of a common material culture, especially in portable objects, provided a means of communicating background information important for subsequent interactions between people. Households obtained and utilized certain types of goods to demonstrate their participation in the social sphere, while individuals may have rearranged or emphasized some of those goods to

proclaim their identity and multiple social roles.

The archaeological investigation of Kaundinyapura and Dhamantri indicates that a regional exchange network was sustained between these sites and other parts of the greater Vidarbha area. More significantly, the distribution of these items throughout the sites indicates that the items distributed in this network were utilized by all sectors of the population and that every household participated in the exchange network. Such participation would have required the production of surplus for exchange, with households managing their economic activities to maintain a minimum level of production to allow for social as well as biological subsistence. In addition to the trade in durable goods such as sandstone and mica noted archaeologically at Kaundinyapura, it appears that there was also a substantial trade in perishable goods including grain. The exchange of many different types of goods indicates that the region was fully-integrated culturally, with conscious choices made about the consumption of goods.

Kaundinyapura and its subsidiary at Dhamantri were able to maintain their position in the trading network not because they had unique products to offer, but because agricultural land and abundant natural resources could be managed by households to produce a surplus for exchange. The climate of central India and the effects of monsoon variability on agriculture require that successful resource-procurement strategies include the flexibility to

increase reliance on wild foods, change crop mixtures, and reallocate household labor. Ethnographic and historical documents illustrate the use of a variety of resource-management strategies utilized in the nineteenth century which can be compared with paleobotanical and archaeological evidence to reconstruct the range of economic activities practiced in the Wardha valley. In the Early Historic period, the inhabitants of Kaundinyapura could utilize their abundant assets in two ways: as outright exports to other areas, or as a source of support for labor turning local materials into finished products.

Sites such as Kaundinyapura participated in a number of different types of economic and social relations simultaneously. It was a producer of some items, and a consumer of others; it was a consuming center in the Wardha valley, and a hinterland vis-à-vis other, larger sites. The fertile soils of the Wardha valley alluvium may have permitted the full integration of Kaundinyapura with the sites located to the east. But why are there so few sites to the west of Kaundinyapura? It may be proposed that the lack of contemporary sites is due to a decreased archaeological investment in this area, and that large sites remain undiscovered to the west of the Wardha valley. However, it may also be that Kaundinyapura represented the furthest limit of a trading network, in which sites to the west of the Wardha valley would have found it difficult to provide sufficient surplus to entice traders that much

further beyond the boundary of the Deccan basalts. Such an hypothesis remains to be tested with further fieldwork and exploration in the areas to the west of the Wardha valley.

Long-distance relationships, such as those manifested in Northern Black Polished Ware, Red Polished ware, or shell items, were perhaps not as important to the inhabitants of Kaundinyapura compared to the utility of local and regional interaction. This scale of interaction may have changed through time as central India became more involved with the other subcontinent-wide developments such as Buddhism. Another future research project of value would consist of examining the role of local exchange at a site in which there was also substantial evidence for the participation one of the very large-scale networks of Early Historic period. Although the trade network of the Kaundinyapura region appears to have been carried out on a relatively small scale, regional exchange was an essential part of social interaction, and was incorporated into the quotidian actions of the site's inhabitants.

The combination of the historic and archaeological record provides greatly enlarged parameters for the way in which people made choices not merely for subsistence, but in selecting preferred items of consumption and generating a consistent surplus directed towards trade. In the case of Kaundinyapura, it was found that there are many different solutions for subsistence scarcity which could have been achieved through the exploitation of resources

within a small radius. However, the archaeological record in both durable and perishable goods indicates that exchange ties were maintained with other areas, and that a complex variety of strategies was probably utilized to maintain those networks. The cultural unity of central India in the Early Historic period is marked by large-scale movements such as the adoption of Buddhism. But the archaeological and historical records also indicate the presence of a continuous series of small-scale, everyday actions in which a common culture was manifested in the use and exchange of ordinary domestic goods.

## APPENDIX A

## THE TYPE COLLECTION FROM KAUNDINYAPURA

CODING GUIDE FOR TYPE COLLECTION

| | |
|---|---|
| BURNISH | 0 none<br>1 present<br>2 indeterminate |
| SLIP | 0 none<br>1 present<br>2 indeterminate |
| MANUFACTURING TECHNIQUE | 0 none evident<br>1 interior striations<br>2 paddle-and-anvil<br>3 slab-built<br>4 wheelmade<br>5 mold-made |
| PASTE TYPE | 1 coarse<br>2 medium coarse<br>3 medium<br>4 fine-medium<br>5 fine<br>6 very fine |
| TEMPER | 1 lime<br>2 mica<br>3 shell<br>4 organic<br>5 sand<br>6 sherd/grog<br>7 limestone<br>8 large sand (1.5 mm or larger)<br>9 basalt<br>10 ash<br>11 other<br>12 brick |

| TYPE | UNIT | BURNISHING EXTERIOR | BURNISHING INTERIOR | BURNISHING VISIBLE | EXTERIOR SLIP/WASH | INTERIOR SLIP/WASH | MANUFACTURING EVIDENCE | PASTE TYPE | CORE? | TEMPER 1 | TEMPER 1 % | TEMPER 2 | TEMPER 2 % | TEMPER 3 | TEMPER 3 % | TEMPER 4 | TEMPER 4 % | WEIGHT (GR) | DIAMETER (CM) | BODY THICKNESS (MM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 201-41 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 15 | 1 | 1 | 0 | 0 | 0 | 0 | 51 | 0 | 18.6 |
| 102 | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | | | | | | | | | | | |
| 103 | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | | | | | | | | | | | |
| 104 | 202-06 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 5 | 1 | 5 | 0 | 0 | 0 | 0 | 116 | 0 | 22.5 |
| 105 | 201-20 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 3 | 5 | 5 | 4 | 3 | 8 | 2 | 75 | 0 | 0.0 |
| 106 | 201-31 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 20 | 2 | 1 | 1 | 5 | 0 | 0 | 27 | 0 | 25.0 |
| 107 | 201-30 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 8 | 5 | 5 | 1 | 2 | 2 | 2 | 83 | 22? | 20.5 |
| 120 | 201-51 | 2 | 0 | 0 | 2 | 1 | 3? | 3 | 1 | 4 | 10 | 5 | 5 | 1 | 2 | 0 | 0 | 126 | >60 | 12.7 |
| 121 | 201-25 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | 4 | 10 | 0 | 0 | 0 | 0 | 68 | 0 | 25.2 |
| 122 | 201-39 | 0 | 0 | 0 | 1 | 1 | 3? | 2 | 1 | 4 | 15 | 7 | 5 | 6 | 1 | 1 | 2 | 97 | >60 | 15.4 |
| 123 | 201-26 | 2 | 0 | 0 | 2 | 1 | 3? | 2 | 1 | 2 | 1 | 5 | 5 | 4 | 15 | 0 | 0 | 36 | >60 | 15.1 |
| 124 | 202-06 | 2 | 0 | 0 | 2 | 0 | 3? | 3 | 0 | 5 | 8 | 2 | 1 | 4 | 10 | 8 | 2 | 44 | 57 | 14.2 |
| 125 | 201-16 | 0 | 1 | 1 | 2 | 2 | 3? | 2 | 1 | 5 | 5 | 8 | 2 | 1 | 1 | 4 | 8 | 86 | 50 | 25.0 |
| 126 | 201-32 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 5 | 10 | 4 | 15 | 1 | 2 | 7 | 1 | 24 | 7 | 13.3 |
| 127 | 201-32 | 0 | 0 | 0 | 1 | 0 | 4 | 3 | 0 | 8 | 2 | 1 | 8 | 5 | 10 | 4 | 10 | 27 | 6 | 11.9 |
| 128 | 201-34 | 2 | 2 | 0 | 1 | 0 | 3? | 2 | 1 | 5 | 10 | 4 | 15 | 2 | 1 | 0 | 0 | 79 | >50 | 26.6 |
| 129 | 201-09 | 0 | 1 | 1 | 2 | 0 | 3? | 3 | 1 | 5 | 2 | 1 | 2 | 4 | 10 | 0 | 0 | 23 | 40 | 13.6 |
| 130 | 201-15 | 0 | 0 | 0 | 0 | 2 | 4 | 3 | 0 | 3 | 1 | 4 | 10 | 5 | 2 | 0 | 0 | 18 | 10 | 12.3 |
| 131 | 201-15 | 0 | 0 | 0 | 2 | 0 | 3? | 2 | 5 | 7 | 2 | 4 | 15 | 2 | 1 | 0 | 0 | 51 | 50 | 15.5 |
| 150 | NOT ASSIGNED | | | | | | | | | | | | | | | | | | | |
| 151 | NOT ASSIGNED | | | | | | | | | | | | | | | | | | | |
| 152 | 204-32 | 0 | 0 | 0 | 0 | 0 | ?4 | 3 | 1 | 1 | 5 | 2 | 1 | 4 | 8 | 5 | 3 | 14 | 28 | 7.7 |
| 153 | 204-02 | 0 | 0 | 0 | 0 | 0 | ?2 | 3 | 1 | 5 | 10 | 4 | 8 | 2 | 1 | 0 | 0 | 9 | 29 | 7.9 |
| 154 | 201-40 | 0 | 0 | 0 | 0 | 0 | ?5 | 4 | 0 | 3 | 3 | 5 | 20 | 4 | 5 | 0 | 0 | 1 | 0 | 7.6 |
| 155 | 204-37 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 4 | 10 | 3 | 2 | 1 | 1 | 0 | 0 | 15 | 19 | 6.9 |
| 156 | 203-12 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 5 | 7 | 5 | 2 | 1 | 4 | 2 | 1 | 3 | 14 | 16 | 5.9 |
| 157 | 201-32 | 0 | 0 | 0 | 0 | 0 | ?5 | 3 | 1 | 1 | 3 | 3 | 3 | 5 | 3 | 4 | 5 | 1 | 0 | 5.7 |
| 157 | 201-32 | 0 | 0 | 0 | 0 | 0 | ?5 | 4 | 1 | 1 | 2 | 5 | 2 | 4 | 8 | 0 | 0 | 3 | 0 | 3.9 |
| 158 | 201-31 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 1 | 3 | 4 | 10 | 0 | 0 | 0 | 0 | 3 | 5 | 6.8 |
| 159 | 203-09 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 5 | 25 | 4 | 10 | 3 | 5 | 0 | 0 | 41 | 48 | 11.8 |
| 160 | 205-08 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 4 | 4 | 20 | 1 | 3 | 0 | 0 | 0 | 0 | 11 | >30 | 8.6 |
| 200 | 201-15 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 1 | 4 | 20 | 5 | 5 | 8 | 5 | 1 | 3 | 24 | 50 | 13.9 |
| 201 | 201-38 | 0 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 3 | 3 | 5 | 8 | 4 | 10 | 1 | 2 | 12 | 31 | 7.9 |
| 202 | 201-40 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 1 | 1 | 5 | 4 | 10 | 10 | 3 | 0 | 0 | 6 | 28 | 5.5 |
| 203 | 201-07 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 1 | 4 | 5 | 2 | 1 | 3 | 1 | 0 | 0 | 8 | 22 | 4.8 |
| 204 | 204-32 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 4 | 8 | 1 | 3 | 0 | 0 | 0 | 0 | 8 | 19 | 5.4 |
| 205 | 201-37 | 1 | 0 | 0 | 1 | 0 | 2? | 3 | 5 | 3 | 1 | 2 | 1 | 4 | 10 | 0 | 0 | 17 | 32 | 8.1 |
| 206 | 201-21 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 4 | 10 | 3 | 1 | 7 | 3 | 5 | 2 | 1 | 0 | 6.8 |
| 207 | 204-32 | 0 | 0 | 0 | 2 | 0 | 4 | 3 | 5 | 2 | 1 | 5 | 8 | 4 | 10 | 1 | 2 | 35 | 27 | 7.5 |
| 208 | 204-37 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 8 | 4 | 7 | 4 | 5 | 8 | 2 | 1 | 15 | 26 | 6.8 |
| 209 | 201-32 | 1 | 1 | 0 | 2 | 2 | 0 | 3 | 0 | 3 | 3 | 5 | 5 | 1 | 2 | 4 | 10 | 3 | 12 | 5.6 |
| 210 | 201-38 | 1 | 0 | 1 | 2 | 0 | 2 | 2 | 1 | 5 | 5 | 4 | 15 | 2 | 1 | 0 | 0 | 31 | 24 | 8.5 |
| 211 | 201-38 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 4 | 5 | 15 | 4 | 10 | 1 | 2 | 0 | 0 | 20 | 28 | 8.3 |
| 212 | 201-22 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 1 | 4 | 15 | 2 | 1 | 5 | 3 | 0 | 0 | 1 | 31 | 3.4 |
| 213 | 201-31 | 0 | 0 | 0 | 2 | 2 | 0 | 4 | 0 | 4 | 10 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 25? | 5.3 |

| NOTES | TYPE |
|---|---|
| Thin tile | 101 |
| Medium tile | 102 |
| Thick tile | 103 |
| Fired clay (tile or brick) | 104 |
| Brick | 105 |
| Daub | 106 |
| Modern tile frag | 107 |
| Mica in slip and wash no more than 1%; no mica in paste | 120 |
| Very fine organics | 121 |
| Coarse organics in paste | 122 |
| Both medium and fine organics in paste | 123 |
| Paste feels gritty under slip; fine organics | 124 |
| Fine organics | 125 |
| String-cut base, diameter 7 cm | 126 |
| String-cut base, diameter 6 cm; bricky, sandy paste | 127 |
| Abraded exterior, lime-coated interior | 128 |
| Very fine organics; matte paste with slightly slate-y look | 129 |
| String-cut base, diameter 10 cm; airy-looking paste, fine organics | 130 |
| Lime smudges over red slip exterior; fabric same as 123 but viscous red slip one side onl | 131 |
| | 150 |
| | 151 |
| Very fine organics | 152 |
| Paste slate-y looking | 153 |
| Probably modern; sand very fine | 154 |
| | 155 |
| Limestone temper is large | 156 |
| Fine organics, not same vessel as other 157 | 157 |
| Not same vessel as other 157 | 157 |
| String-cut base; fine organics | 158 |
| Very gritty paste | 159 |
| Airy organic crude ware, organic voids visible; interior wash probably a self-slip | 160 |
| Thick jar, thick red slip both sides | 200 |
| 1% medium mica in red thick slip both sides | 201 |
| Very fine lime inclusions, organic voids visible | 202 |
| Very fine organics, 2% fine mica in slip both sides | 203 |
| Fracture in section parallel to interior; very fine organics; airy paste--modern? | 204 |
| Very fine organics | 205 |
| Bright red slip/wash (not clear if slip is interior or exterior); 5% mica in slip | 206 |
| Very fine organics; not clear if slip is interior or exterior | 207 |
| Slate-y looking | 208 |
| Interior shows incipient fracture parallel to surface | 209 |
| | 210 |
| Reduced core takes up all of sherd profile; organic content (large organics) high for a ( | 211 |
| Reduced core takes up all of sherd profile; paste airy-looking | 212 |
| Very fine organics; very fine mica in slip; both sides slip version of 204; modern? | 213 |

| TYPE | UNIT | BURNISHING EXTERIOR | BURNISHING INTERIOR | BURNISHING VISIBLE | EXTERIOR SLIP/WASH | INTERIOR SLIP/WASH | MANUFACTURING EVIDENCE | PASTE TYPE | CORE? | TEMPER 1 | TEMPER 1 % | TEMPER 2 | TEMPER 2 % | TEMPER 3 | TEMPER 3 % | TEMPER 4 | TEMPER 4 % | WEIGHT (GR) | DIAMETER (CM) | BODY THICKNESS (MM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 214 | 201-30 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 5 | 20 | 4 | 10 | 2 | 1 | 3 | 1 | 1 | 0 | 3.5 |
| 215 | 201-49 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 5 | 4 | 15 | 5 | 5 | 2 | 1 | 1 | 3 | 1 | 0 | 5.5 |
| 216 | 201-15 | 0 | 0 | 0 | 2 | 2 | 4 | 3 | 1 | 5 | 8 | 1 | 3 | 4 | 10 | 3 | 2 | 73 | 35 | 6.3 |
| 217 | 203-11 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 3 | 4 | 10 | 1 | 2 | 2 | 2 | 0 | 0 | 1 | 7 | 2.5 |
| 218 | 204-32 | 0 | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 8 | 15 | 5 | 15 | 1 | 2 | 4 | 5 | 25 | 30 | 8.8 |
| 220 | 201-26 | 1 | 0 | 1 | 2 | 0 | 2? | 3 | 0 | 3 | 3 | 5 | 8 | 4 | 5 | 0 | 0 | 49 | 47 | 7.6 |
| 220A | 201-32 | 2 | 0 | 0 | 2 | 0 | 2 | 3 | 1 | 4 | 10 | 7 | 5 | 5 | 3 | 0 | 0 | 34 | 38 | 8.2 |
| 221 | 201-31 | 1 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | 4 | 20 | 2 | 1 | 0 | 0 | 48 | 45 | 12.8 |
| 222 | 201-45 | 1 | 0 | 1 | 2 | 0 | 2 | 3 | 1 | 5 | 20 | 2 | 1 | 1 | 2 | 4 | 5 | 21 | 35 | 9.4 |
| 223 | 201-24 | 1 | 0 | 2 | 2 | 0 | 2 | 3 | 1 | 5 | 8 | 4 | 15 | 3 | 1 | 1 | 1 | 29 | 45 | 9.7 |
| 224 | 201-40 | 1 | 0 | 2 | 2 | 0 | 4? | 3 | 5 | 5 | 5 | 4 | 15 | 1 | 2 | 0 | 0 | 7 | 30 | 6.5 |
| 224 | 201-09 | 1 | 0 | 2 | 2 | 0 | 2 | 3 | 5 | 6 | 1 | 4 | 10 | 2 | 1 | 5 | 1 | 4 | 35 | 5.5 |
| 225 | 204-06 | 1 | 0 | 1 | 2 | 0 | 2 | 3 | 1 | 4 | 5 | 2 | 3 | 5 | 15 | 1 | 3 | 12 | 25 | 6.9 |
| 226 | 202-08 | 1 | 0 | 0 | 2 |  | 2? | 3 | 1 | 5 | 20 | 1 | 2 | 4 | 3 | 8 | 5 | 13 | 35 | 6.8 |
| 227 | 201-32 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 5 | 5 | 15 | 6 | 2 | 0 | 0 | 7 | 30 | 6.6 |
| 228 | 201-22 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 7 | 3 | 1 | 3 | 5 | 5 | 4 | 10 | 1 | 0 | 7.9 |
| 229 | 201-40 | 1 | 0 | 1 | 2 | 0 | 2? | 4 | 0 | 5 | 8 | 4 | 10 | 3 | 1 | 2 | 1 | 3 | 40 | 4.9 |
| 230 | 201-44 | 1 | 0 | 1 | 2 | 0 | 4 | 3 | 5 | 2 | 5 | 5 | 3 | 4 | 5 | 0 | 0 | 6 | 15 | 6.0 |
| 231 | 201-09 | 1 | 0 | 2 | 2 | 0 | 0 | 3 | 5 | 4 | 10 | 1 | 2 | 2 | 1 | 0 | 0 | 5 | 25 | 5.3 |
| 232 | 204-37 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 0 | 1 | 5 | 6 | 1 | 4 | 3 | 10 | 5 | 4 | 40 | 3.5 |
| 233 | 201-36 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 1 | 2 | 5 | 5 | 3 | 4 | 10 | 0 | 0 | 2 | 25 | 5.4 |
| 234 | 201-24 | 1 | 0 | 1 | 2 | 0 | 4 | 4 | 0 | 4 | 3 | 1 | 3 | 2 | 1 | 0 | 0 | 5 | 18 | 3.7 |
| 235 | 201-31 | 1 | 0 | 2 | 2 | 0 | 2 | 4 | 1 | 4 | 10 | 5 | 5 | 1 | 3 | 0 | 0 | 13 | 40 | 4.6 |
| 236 | 201-15 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 0 | 4 | 5 | 1 | 2 | 0 | 0 | 5 | 3 | 3 | 30 | 4.6 |
| 237 | 201-31 | 1 | 1 | 2 | 2 | 2 | 0 | 3 | 0 | 5 | 8 | 4 | 10 | 1 | 3 | 8 | 3 | 43 | 25 | 9.6 |
| 238 | 201-07 | 1 | 0 | 1 | 2 | 2 | 0 | 3 | 5 | 4 | 15 | 1 | 3 | 5 | 10 | 2 | 1 | 2 | N/A | 5.5 |
| 239 | 202-08 | 1 | 0 | 1 | 2 | 0 | 2? | 3 | 0 | 2 | 5 | 5 | 15 | 9 | 2 | 2 | 1 | 11 | 28 | 5.9 |
| 239 | 201-38 | 1 | 0 | 1 | 2 | 1 | 0 | 3 | 1 | 4 | 15 | 5 | 5 | 1 | 3 | 0 | 0 | 19 | 30 | 6.6 |
| 240 | 201-38 | 1 | 1 | 2 | 2 | 2 | 0 | 3 | 0 | 4 | 15 | 5 | 3 | 9 | 3 | 1 | 1 | 2 | 13 | 4.9 |
| 240 | 201-09 | 1 | 1 | 2 | 2 | 2 | 0 | 3 | 1 | 4 | 15 | 2 | 3 | 5 | 2 | 0 | 0 | 3 | 21 | 4.4 |
| 241 | 201-38 | 1 | 0 | 1 | 2 | 0 | 0 | 5 | 0 | 5 | 15 | 4 | 5 | 0 | 0 | 0 | 0 | 1 | >20 | 2.3 |
| 242 | 201-38 | 1 | 1 | 1 | 2 | 0 | 0 | 4 | 1 | 1 | 1 | 2 | 1 | 4 | 5 | 0 | 0 | 1 | 10? | 2.7 |
| 243 | 201-31 | 1 | 0 | 2 | 2 | 0 | 2 | 3 | 5 | 4 | 15 | 3 | 2 | 5 | 2 | 0 | 0 | 9 | 25 | 4.9 |
| 244 | 201-31 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 1 | 5 | 10 | 3 | 2 | 0 | 0 | 4 | 10 | 4 | 30 | 5.6 |
| 245 | 201-31 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 0 | 5 | 8 | 8 | 8 | 1 | 2 | 4 | 10 | 1 | ? | 7.0 |
| 246 | 201-31 | 0 | 1 | 2 | 1 | 2 | 0 | 3 | 0 | 6 | 3 | 1 | 5 | 5 | 5 | 7 | 3 | 23 | 14 | 7.4 |
| 247 | 201-37 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 0 | 1 | 5 | 5 | 8 | 0 | 0 | 4 | 5 | 1 | ? | 3.9 |
| 248 | 201-09 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 1 | 4 | 8 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | >20 | 3.1 |
| 249 | 201-09 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 5 | 4 | 15 | 5 | 3 | 2 | 1 | 0 | 0 | 4 | ? | 9.8 |
| 250 | 201-09 | 1 | 0 | 2 | 2 | 1 | 0 | 3 | 1 | 1 | 3 | 0 | 0 | 5 | 5 | 10 | 10 | 7 | 30 | 6.8 |
| 251 | 201-09 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 4 | 15 | 3 | 2 | 2 | 1 | 1 | 5 | 4 | >20 | 5.6 |
| 252 | 201-09 | 1 | 1 | 2 | 2 | 2 | 0 | 4 | 1 | 4 | 10 | 5 | 5 | 2 | 1 | 0 | 0 | 1 | 16? | 4.4 |
| 253 | 201-26 | 1 | 1 | 2 | 2 | 2 | 0 | 3 | 1 | 4 | 15 | 1 | 2 | 3 | 2 | 5 | 5 | 8 | 20 | 5.0 |
| 254 | 201-26 | 1 | 0 | 2 | 2 | 1 | 2? | 3 | 0 | 5 | 40 | 3 | 1 | 2 | 1 | 0 | 0 | 17 | 40 | 2.5 |
| 255 | 201-22 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 1 | 4 | 8 | 1 | 2 | 2 | 1 | 0 | 0 | 2 | 25 | 3.4 |

| NOTES | TYPE |
|---|---|
| Paste reduced; very small sherd | 214 |
| 2% mica in slip | 215 |
| Lime coating interior; slate-y paste | 216 |
| | 217 |
| | 218 |
| Sandy-feeling interior; very fine organics; hair-strand burnish | 220 |
| Slate-y paste; hair-strand burnish | 220A |
| Thick sherd | 221 |
| Very sandy interior; crackled thick high-gloss red slip | 222 |
| Reduced core takes up all of sherd profile; medium-sized organics | 223 |
| Thick red slip, but different from that seen at survey sites; small and medium organics | 224 |
| | 224 |
| Thick, fugitive red slip | 225 |
| Thick, glossy slip; very fine organics | 226 |
| Glossy, well-adhered red slip; a thin version of 220 | 227 |
| ?Lime coating interior; not clear if slip is interior or exterior | 228 |
| Crackly, shiny slip, similar to the oxydized portion of black-and-red (400 series) wares | 229 |
| Thick glossy red slip, slightly fugitive | 230 |
| ?Lime coating interior; thick, red-orange adhering slip; very fine organics | 231 |
| Very fine organics | 232 |
| High-gloss exterior; very fine organics | 233 |
| Relatively glossy slip; well-burnished; very fine organics | 234 |
| Well-burnished; burnish marks thin | 235 |
| High-gloss slip | 236 |
| Thick slip; medium organics; a both sides slip version of 220 | 237 |
| Slip marred by burnt-out medium organics; "interior" and "exterior" may be reversed | 238 |
| Paste slightly more pink than Munsell permits; paste gritty | 239 |
| Gritty, slate-y paste; thick matte slip; medium organics | 239 |
| Bright, thick red slip; this is a neck fragment | 240 |
| Medium organics, fine sand | 240 |
| High-gloss slip; quartz sand is large | 241 |
| Glossy slip both sides; very fine organics | 242 |
| Slate-y gray paste; medium-sized organics | 243 |
| Fugitive thick shiny slip; fine organics; exterior and paste similar to 230; modern? | 244 |
| | 245 |
| Slip is glossy where burnished | 246 |
| Reduced core takes up all of sherd profile; fine organics | 247 |
| Well-burnished red slip; large organics | 248 |
| 2% mica in slip both sides; thick slip is marred by burnt-out organics | 249 |
| Slate-y gray paste | 250 |
| Rim; both sides version of 223 | 251 |
| Rim of probably black-and-red (400 series) bowl | 252 |
| Rim; 2% medium mica in thick slip; paste feels gritty | 253 |
| Very friable; hair-strand striations in burnish | 254 |
| ?Lime coating interior; slightly crackled thick slip; well-burnished | 255 |

| TYPE | UNIT | BURNISHING EXTERIOR | BURNISHING INTERIOR | BURNISHING VISIBLE | EXTERIOR SLIP/WASH | INTERIOR SLIP/WASH | MANUFACTURING EVIDENCE | PASTE TYPE | CORE? | TEMPER 1 | TEMPER 1 % | TEMPER 2 | TEMPER 2 % | TEMPER 3 | TEMPER 3 % | TEMPER 4 | TEMPER 4 % | WEIGHT (GR) | DIAMETER (CM) | BODY THICKNESS (MM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 295 | | | | | | | | | | | | | | | | | | | | |
| 296 | | | | | | | | | | | | | | | | | | | | |
| 297 | | | | | | | | | | | | | | | | | | | | |
| 298 | | | | | | | | | | | | | | | | | | | | |
| 299 | | | | | | | | | | | | | | | | | | | | |
| 300 | 201-09 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 4 | 25 | 5 | 2 | 1 | 3 | 0 | 0 | 11 | 30 | 10.3 |
| 301 | 204-06 | 1 | 0 | 1 | 2 | 1 | 2? | 3 | 1 | 7 | 2 | 5 | 5 | 4 | 15 | 1 | 3 | 10 | 20 | 10.0 |
| 302 | 202-06 | 1 | 0 | 1 | 2 | 1 | 0 | 2 | 1 | 5 | 8 | 9 | 2 | 4 | 15 | 0 | 0 | 42 | >50 | 13.3 |
| 303 | 201-37 | 1 | 0 | 1 | 2 | 0 | 2? | 3 | 1 | 4 | 15 | 2 | 2 | 1 | 2 | 5 | 5 | 8 | 35 | 6.0 |
| 303 | 201-37 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 5 | 5 | 4 | 15 | 1 | 2 | 7 | 2 | 41 | 24 | 8.3 |
| 304 | 202-06 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 1 | 5 | 25 | 4 | 8 | 7 | 2 | 0 | 0 | 49 | 40 | 8.5 |
| 305 | 201-37 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 1 | 5 | 3 | 4 | 15 | 3 | 1 | 2 | 1 | 22 | 33 | 6.4 |
| 305 | 201-37 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 5 | 4 | 15 | 5 | 5 | 2 | 1 | 3 | 3 | 12 | 40 | 6.8 |
| 306 | 201-38 | 1 | 0 | 2 | 2 | 0 | 2? | 3 | 5 | 5 | 15 | 4 | 8 | 3 | 3 | 1 | 2 | 11 | 40 | 6.9 |
| 307 | 201-27 | 1 | 0 | 0 | 2 | 2 | 0 | 3 | 1 | 5 | 15 | 6 | 1 | 2 | 1 | 4 | 5 | 4 | 36 | 7.8 |
| 308 | 201-31 | 1 | 0 | 1 | 2 | 0 | 2 | 4 | 1 | 4 | 8 | 5 | 5 | 3 | 2 | 2 | 2 | 4 | 25 | 4.4 |
| 309 | 201-31 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 5 | 40 | 8 | 3 | 0 | 0 | 0 | 0 | 40 | 20 | 11.5 |
| 310 | 201-31 | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 7 | 5 | 5 | 15 | 2 | 1 | 0 | 0 | 22 | 40 | 6.6 |
| 311 | 201-49 | 0 | 0 | 0 | 1 | 1 | 2? | 3 | 5 | 5 | 5 | 4 | 15 | 2 | 1 | 0 | 0 | 6 | 20 | 5.3 |
| 312 | 201-49 | 0 | 0 | 0 | 2 | 2 | 4? | 3 | 5 | 3 | 1 | 5 | 5 | 4 | 10 | 2 | 2 | 160 | 22 | 11.4 |
| 313 | 201-49 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 1 | 4 | 15 | 5 | 15 | 2 | 5 | 0 | 0 | 13 | 23 | 8.5 |
| 314 | 201-26 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 5 | 7 | 2 | 5 | 15 | 4 | 10 | 1 | 5 | 59 | 28 | 6.3 |
| 315 | 501-49 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 1 | 5 | 2 | 1 | 5 | 20 | 0 | 0 | 4 | >/=20 | 6.0 |
| 320 | 201-39 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 4 | 20 | 2 | 1 | 1 | 3 | 0 | 0 | 21 | 20 | 8.4 |
| 321 | 201-37 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 4 | 15 | 2 | 1 | 0 | 0 | 0 | 0 | 9 | >40 | 6.9 |
| 322 | 201-15 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 1 | 4 | 15 | 5 | 3 | 0 | 0 | 0 | 0 | 31 | 40 | 10.3 |
| 323 | 203-12 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 1 | 6 | 1 | 8 | 2 | 5 | 15 | 4 | 8 | 9 | >50 | 6.7 |
| 324 | 201-34 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 5 | 5 | 10 | 4 | 15 | 1 | 1 | 2 | 2 | 2 | >30 | 5.9 |
| 325 | 201-39 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 5 | 4 | 10 | 5 | 5 | 1 | 2 | 0 | 0 | 13 | 33 | 5.4 |
| 326 | 204-02 | 1 | 0 | 0 | 2? | 0 | 2 | 3 | 5 | 5 | 10 | 4 | 10 | 0 | 0 | 0 | 0 | 9 | 38 | 3.8 |
| 327 | 204-06 | 1 | 0 | 2 | 2 | 0 | 2 | 2 | 1 | 3 | 15 | 5 | 5 | 4 | 8 | 1 | 2 | 58 | 50 | 9.9 |
| 328 | 201-38 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 4 | 10 | 2 | 1 | 5 | 5 | 0 | 0 | 3 | 24 | 3.9 |
| 329 | 201-38 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 5 | 4 | 10 | 5 | 5 | 1 | 3 | 0 | 0 | 2 | ? | 7.3 |
| 329 | 201-31 | 1 | 1 | 0 | 2 | 2 | 0 | 3 | 5 | 7 | 5 | 4 | 8 | 5 | 3 | 0 | 0 | 2 | 0 | 6.3 |
| 330 | 201-31 | 1 | 1 | 0 | 2 | 2 | 0 | 3 | 1 | 4 | 15 | 1 | 3 | 0 | 0 | 0 | 0 | 12 | 24 | 9.9 |
| 331 | 201-31 | 1 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 2 | 1 | 3 | 2 | 5 | 2 | 0 | 0 | 1 | 16 | 2.5 |
| 332 | 201-37 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 1 | 2 | 1 | 5 | 2 | 4 | 15 | 0 | 0 | 3 | 12 | 6.0 |
| 332A | 201-31 | 1 | 0 | 2 | 2 | 2 | 0 | 3 | 1 | 2 | 1 | 5 | 15 | 4 | 5 | 3 | 3 | 2 | 28 | 3.7 |
| 333 | 201-31 | | | | | | | | | | | | | | | | | | | |
| 334 | 201-37 | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 0 | 5 | 1 | 4 | 10 | 0 | 0 | 0 | 0 | 1 | 20 | 3.4 |
| 334A | 201-31 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 5 | 5 | 15 | 4 | 10 | 2 | 2 | 0 | 0 | 3 | 24 | 4.9 |
| 335 | 201-37 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 5 | 15 | 4 | 15 | 0 | 0 | 0 | 0 | 5 | 15 | 3.8 |
| 336 | 201-37 | 1 | 1 | 1 | 2 | 1 | 0 | 3 | 1 | 5 | 5 | 6 | 3 | 4 | 10 | 2 | 1 | 36 | 44 | 5.0 |
| 337 | 201-09 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 5 | 15 | 4 | 10 | 2 | 1 | 0 | 0 | 10 | 16 | 5.4 |
| 337 | 201-09 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 5 | 15 | 4 | 10 | 2 | 1 | 0 | 0 | 5 | 16 | 5.4 |

| NOTES | TYPE |
|---|---|
| General redware category, unidentified redwares (i.e. abraded) | |
| General redware category, wash one side | 296 |
| General redware category, wash both sides | 297 |
| General redware category, slip one side | 298 |
| General redware category, slip both sides | 299 |
| Large-size organics--rice husk? | 300 |
| Gray, slate-y paste; smooth brown slip | 301 |
| Crackled thick slip; very fine organics | 302 |
| Crackled thick slip; similar to 222 | 303 |
| Crackled thick slip; similar to 223 | 303 |
| Very crude, heavy paste | 304 |
| Reduced core takes up all of sherd profile; ?lime coating interior | 305 |
| 2% fine mica in slip; interior has fracture paralle to surface | 305 |
| Dull matte slip; gritty paste | 306 |
| Thick adhering slip exterior, marred by burnt-out organics interior; very fine sand | 307 |
| Dull slip; medium organics | 308 |
| Similar to 254 in paste, but surface treatment is different | 309 |
| Sandy, gritty, very hard paste | 310 |
| Interior slip overfired; fine sand; probably modern | 311 |
| Thick matte slip; massive neck sherd; both sides slip version of 305 | 312 |
| Reduced core takes up all of sherd profile; very friable, crumbly paste | 313 |
| Rim 8-2; paste dense | 314 |
| Very hard paste | 315 |
| Thick, well-burnished slip; medium organics | 320 |
| Well-burnished slip; fine organics | 321 |
| Medium-thick slip | 322 |
| Well-burnished slip; paste has sandy feel interior | 323 |
| Well-burnished slip | 324 |
| Well-burnished thick slip | 325 |
| Some lime coating interior? Core is only slightly gray | 326 |
| "Weird ware"; temper is burnt shell? | 327 |
| one side slip version of 326; slip is on interior | 328 |
| | 329 |
| both sides slip version of 321; very fine organics | 329 |
| Well-finished slip both sides; medium organics | 330 |
| | 331 |
| both sides slip version of (e.g.) 305 | 332 |
| Vessel neck | 332A |
| | 333 |
| Highly polished, non-abraded; thin version of 325 | 334 |
| Crackling slip exterior | 334A |
| Rim 3-10 | 335 |
| Rim 23-8; very hard paste | 336 |
| Rim 5-4 | 337 |
| | 337 |

| TYPE | UNIT | BURNISHING EXTERIOR | BURNISHING INTERIOR | BURNISHING VISIBLE | EXTERIOR SLIP/WASH | INTERIOR SLIP/WASH | MANUFACTURING EVIDENCE | PASTE TYPE | CORE? | TEMPER 1 | TEMPER 1 % | TEMPER 2 | TEMPER 2 % | TEMPER 3 | TEMPER 3 % | TEMPER 4 | TEMPER 4 % | WEIGHT (GR) | DIAMETER (CM) | BODY THICKNESS (MM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 338 | 201-49 | 0 | 0 | 0 | 1 | 0 | 2 | 4 | 1 | 1 | 5 | 5 | 3 | 4 | 15 | 0 | 0 | 4 | 30 | 4.4 |
| 339 | 201-49 | 1 | 0 | 1 | 2 | 0 | 2 | 3 | 1 | 5 | 10 | 4 | 15 | 8 | 5 | 0 | 0 | 3 | 24 | 4.7 |
| 340 | 201-49 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 5 | 4 | 15 | 5 | 8 | 2 | 1 | 1 | 3 | 5 | 24 | 3.9 |
| 341 | 201-49 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 5 | 25 | 2 | 1 | 4 | 5 | 0 | 0 | 4 | 24 | 6.5 |
| 342 | 201-49 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 4 | 5 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 24 | 2.6 |
| 343 | 201-26 | 1 | 1 | 0 | 2 | 0? | 0 | 3 | 1 | 5 | 15 | 4 | 5 | 2 | 1 | 0 | 0 | 18 | 26 | 5.4 |
| 351 | 201-07 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 4 | 20 | 6 | 2 | 0 | 0 | 0 | 0 | 8 | 40 | 9.3 |
| 352 | 201-41 | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 0 | 4 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 22 | 3.9 |
| 353 | 201-38 | 1 | 1 | 0 | 2 | 2 | 0 | 6 | 0 | 10 | 4 | 6 | 3 | 0 | 0 | 0 | 0 | 1 | 36 | 2.5 |
| 354 | 201-38 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | 4 | 4 | 10 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | 42? | 4.9 |
| 355 | 201-38 | 1 | 1 | 1 | 2 | 2 | 0 | 5 | 0 | 5 | 2 | 4 | 10 | 0 | 0 | 0 | 0 | 1 | 30 | 3.5 |
| 356 | 201-30 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 4 | 5 | 20 | 4 | 10 | 2 | 1 | 0 | 0 | 10 | 36 | 5.3 |
| 357 | 204-36 | 1 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 1 | 2 | 5 | 5 | 4 | 5 | 2 | 1 | 13 | 9 | 4.7 |
| 358 | 204-34 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 0 | 4 | 10 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 24? | 5.7 |
| 359 | 501-52 | 1 | 0 | 2 | 2 | 0 | 1 | 4 | 0 | 1 | 5 | 4 | 5 | 5 | 5 | 0 | 0 | 6 | 15 | 4.5 |
| 396 | | | | | | | | | | | | | | | | | | | | |
| 397 | | | | | | | | | | | | | | | | | | | | |
| 398 | | | | | | | | | | | | | | | | | | | | |
| 399 | | | | | | | | | | | | | | | | | | | | |
| 400 | 204-35 | 1 | 1 | 0 | 2 | 2 | 2 | 3 | 1 | 5 | 15 | 4 | 10 | 3 | 2 | 2 | 1 | 11 | 38 | 8.4 |
| 401 | 201-16 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 0 | 5 | 5 | 4 | 15 | 1 | 3 | 0 | 0 | 4 | 42 | 5.3 |
| 401 | 201-09 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 5 | 5 | 5 | 4 | 10 | 1 | 5 | 0 | 0 | 6 | 36 | 4.7 |
| 402 | 201-40 | 1 | 1 | 2 | 2 | 1 | 0 | 2 | 1 | 5 | 5 | 4 | 20 | 1 | 3 | 0 | 0 | 11 | 34 | 8.2 |
| 403 | 201-24 | 1 | 1 | 0 | 2 | 2 | 0 | 4 | 5 | 5 | 5 | 4 | 5 | 0 | 0 | 1 | 3 | 6 | 46 | 5.6 |
| 404 | 201-40 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 5 | 5 | 4 | 5 | 0 | 0 | 1 | 1 | 3 | 46 | 5.3 |
| 405 | 201-34 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 5 | 5 | 5 | 4 | 10 | 1 | 3 | 0 | 0 | 4 | 48 | 4.5 |
| 406 | 201-40 | 1 | 1 | 1 | 2 | 2 | 0 | 5 | 5 | 5 | 3 | 4 | 10 | 2 | 1 | 0 | 0 | 2 | 20 | 3.7 |
| 407 | 201-49 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 5 | 5 | 5 | 4 | 10 | 2 | 1 | 0 | 0 | 1 | 26 | 4.7 |
| 408 | 201-14 | 1 | 0 | 0 | 2 | 0 | 0 | 4 | 4 | 4 | 15 | 2 | 2 | 5 | 5 | 1 | 3 | 2 | 44 | 4.2 |
| 409 | 201-38 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 5 | 3 | 4 | 15 | 2 | 1 | 0 | 0 | 3 | 12 | 3.3 |
| 410 | 201-32 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 5 | 5 | 30 | 0 | 0 | 8 | 5 | 0 | 0 | 4 | 26 | 6.6 |
| 411 | 201-32 | 1 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 5 | 5 | 15 | 4 | 10 | 0 | 0 | 8 | 28 | 5.6 |
| 412 | 201-38 | 1 | 1 | 2 | 2 | 2 | 0 | 4 | 0 | 5 | 10 | 4 | 5 | 3 | 1 | 0 | 0 | 3 | 34 | 4.4 |
| 413 | 201-38 | 1 | 1 | 2 | 2 | 2 | 0 | 5 | 5 | 4 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 1 | 30 | 3.5 |
| 413 | 201-30 | 1 | 1 | 0 | 2 | 2 | 0 | 5 | 5 | 4 | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 2 | 28 | 3.8 |
| 414 | 201-31 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 4 | 5 | 5 | 5 | 1 | 5 | 0 | 0 | 1 | 28 | 4.8 |
| 415 | 201-03 | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 1 | 1 | 2 | 4 | 5 | 5 | 5 | 0 | 0 | 1 | 36 | 3.8 |
| 416 | N/A | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 4 | 5 | 5 | 25 | 2 | 2 | 0 | 0 | 3 | | 7.4 |
| 417 | N/A | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 0 | 5 | 5 | 4 | 10 | 6 | 3 | 1 | 3 | 3 | 32 | 4.7 |
| 418 | N/A | 1 | 1 | 1 | 2 | 2 | 0 | 4 | 0 | 5 | 10 | 4 | 10 | 0 | 0 | 0 | 0 | 1 | 20 | 4.4 |
| 419 | 201-30 | 1 | 1 | 0 | 2 | 2 | 0 | 3 | 5 | 4 | 15 | 5 | 2 | 1 | 3 | 0 | 0 | 3 | 13 | 4.5 |
| 420 | 201-49 | 1 | 1 | 1 | 0 | 0 | 0 | 4 | 0 | 4 | 15 | 2 | 1 | 5 | 5 | 0 | 0 | 13 | 17 | 4.3 |
| 421 | 201-39 | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 4 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 22 | 6.5 |
| 422 | 202-16 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 5 | 4 | 15 | 5 | 2 | 1 | 2 | 2 | 2 | 16 | 46 | 5.6 |
| 450 | 203-25 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 5 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | >20 | 7.1 |

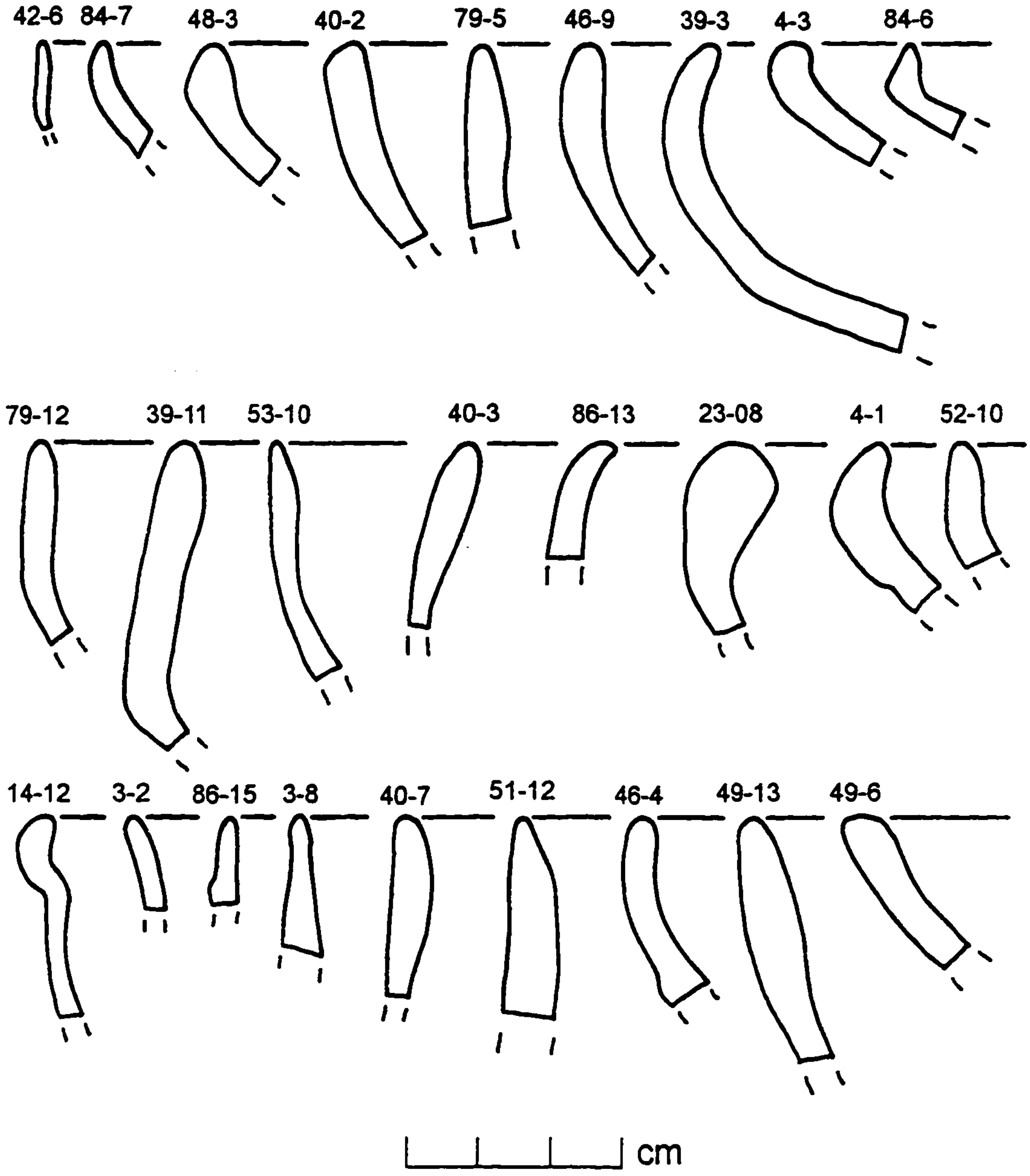
| NOTES | TYPE |
|---|---|
| Interior shiny--from use? | 338 |
| 2% fine mica in exterior slip; 5% medium mica visible interior | 339 |
| | 340 |
| 1% mica visible in exterior slip and in unslipped interior | 341 |
| Should be considered a black-and-red (400 series) ware | 342 |
| Rim 7- FILL IN? | 343 |
| Thoroughly reduced | 351 |
| Rim; high-polish "black-and-red" ware | 352 |
| Probably "Northern Black Polish" ware; temper checked with 30x microscope | 353 |
| (not a good type) | 354 |
| Thin version of 352 | 355 |
| Very friable | 356 |
| Soft paste; well-burnished exterior, not burnished interior | 357 |
| Fine soft paste; organic voids in exterior; thick glossy slip; medieval? | 358 |
| Thick glossy slip exterior, sandy interior with striations, olive-colored paste | 359 |
| General brownware category, wash one side | 396 |
| General brownware category, wash both sides | 397 |
| General brownware category, slip one side | 398 |
| General brownware category, slip both sides | 399 |
| | 400 |
| High-polish "black-and-red" ware | 401 |
| | 401 |
| Organics visible through slip | 402 |
| High-polish "black-and-red" ware | 403 |
| High-polish "black-and-red" ware | 404 |
| High-polish "black-and-red" ware | 405 |
| High-polish "black-and-red" ware | 406 |
| High-polish "black-and-red" ware | 407 |
| Abraded; not a good type; similar to 407 | 408 |
| Well-burnished | 409 |
| Sand shows through slip | 410 |
| | 411 |
| High-polish "black-and-red" ware; thin version of 403 | 412 |
| High-polish "black-and-red" ware; thin version of 405 | 413 |
| | 413 |
| Same as 404, but yellow slip both sides | 414 |
| | 415 |
| Overfired exterior; sand shows through slip; both sides version of 410; modern? | 416 |
| High-polish "black-and-red" ware | 417 |
| High-polish "black-and-red" ware | 418 |
| Rim | 419 |
| Probably not "black-and-red" ware, because although burnished is not glossy | 420 |
| Rim, almost certainly modern | 421 |
| Very thick, high-polish "black-and-red" ware | 422 |
| Rim; kaolin ware | 450 |

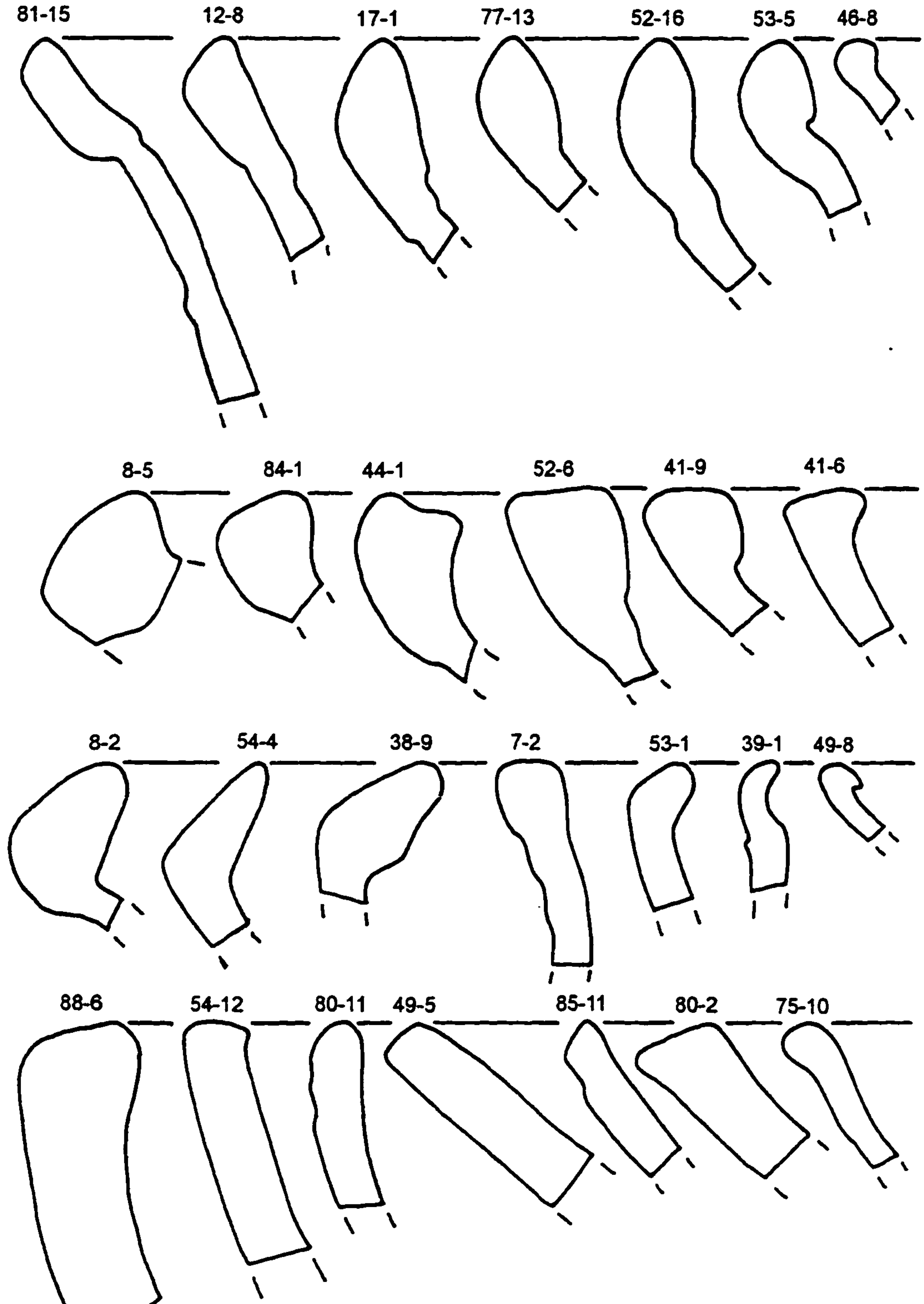
| TYPE | UNIT | BURNISHING EXTERIOR | BURNISHING INTERIOR | BURNISHING VISIBLE | EXTERIOR SLIP/WASH | INTERIOR SLIP/WASH | MANUFACTURING EVIDENCE | PASTE TYPE | CORE? | TEMPER 1 | TEMPER 1 % | TEMPER 2 | TEMPER 2 % | TEMPER 3 | TEMPER 3 % | TEMPER 4 | TEMPER 4 % | WEIGHT (GR) | DIAMETER (CM) | BODY THICKNESS (MM) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 204-37 | 0 | 0 | 0 | 2 | 2 | 0 | 2 | 0 | 5 | 30 | 2 | 2 | 8 | 10 | 0 | 0 | 10 | 28 | 7.7 |
| 501 | 201-40 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 5 | 15 | 4 | 15 | 2 | 2 | 0 | 0 | 11 | 24 | 10.4 |
| 502 | 201-37 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 5 | 15 | 2 | 1 | 4 | 10 | 0 | 0 | 7 | 42 | 8.3 |
| 503 | 201-38 | 1 | 0 | 1 | 2 | 0 | 2 | 3 | 0 | 5 | 5 | 4 | 15 | 2 | 1 | 3 | 2 | 16 | 20 | 5.6 |
| 504 | 201-40 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 2 | 10 | 5 | 20 | 4 | 5 | 0 | 0 | 3 | 36 | 5.3 |
| 505 | 201-27 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 5 | 2 | 15 | 5 | 15 | 4 | 5 | 0 | 0 | 3 | 44 | 4.4 |
| 506 | 201-49 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 2 | 5 | 4 | 10 | 0 | 0 | 0 | 0 | 9 | 34 | 3.8 |
| 507 | 201-49 | 0 | 0 | 0 | 1 | 0 | 2 | 4 | 0 | 2 | 2 | 4 | 10 | 5 | 10 | 0 | 0 | 27 | 44 | 3.6 |
| 508 | 201-16 | 0 | 0 | 0 | 2 | 0 | 1 | 3 | 5 | 2 | 5 | 4 | 15 | 3 | 5 | 5 | 5 | 13 | 34 | 7.4 |
| 509 | 201-31 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 1 | 8 | 2 | 5 | 10 | 4 | 10 | 2 | 2 | 2 | 36 | 5.4 |
| 510 | 201-09 | 1 | 0 | 1 | 2 | 0 | 0 | 4 | 0 | 2 | 2 | 5 | 2 | 4 | 10 | 0 | 0 | 4 | 28 | 3.6 |
| 511 | 201-37 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 5 | 2 | 4 | 10 | 0 | 0 | 0 | 0 | 2 | | 6.7 |
| 512 | 201-32 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 5 | 20 | 2 | 10 | 0 | 0 | 0 | 0 | 1 | | 4.3 |
| 513 | 201-32 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 0 | 5 | 15 | 2 | 5 | 0 | 0 | 0 | 0 | 4 | 36 | 4.9 |
| 514 | 201-38 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 5 | 5 | 25 | 8 | 5 | 0 | 0 | 1 | 34 | 2.9 |
| 515 | 201-37 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 5 | 8 | 10 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | 42 | 2.6 |
| 515 | 201-31 | 1 | 0 | 0 | 2 | 0 | 0 | 4 | 5 | 4 | 10 | 5 | 5 | 0 | 0 | 0 | 0 | 1 | 40 | 1.5 |
| 516 | 201-31 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 5 | 5 | 20 | 2 | 2 | 3 | 2 | 0 | 0 | 4 | 38 | 4.4 |
| 517 | 201-31 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 5 | 5 | 2 | 20 | 4 | 10 | 0 | 0 | 8 | 32 | 6.3 |
| 518 | 201-31 | 1 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 2 | 2 | 5 | 10 | 4 | 10 | 0 | 0 | 1 | 32 | 3.9 |
| 518 | 201-30 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 5 | 10 | 2 | 15 | 0 | 0 | 0 | 0 | 1 | 36 | 2.4 |
| 519 | 201-31 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 1 | 3 | 2 | 20 | 5 | 5 | 0 | 0 | 6 | 8 | 4.0 |
| 520 | 201-31 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 4 | 15 | 2 | 5 | 0 | 0 | 0 | 0 | 22 | 44 | 7.3 |
| 521 | 201-37 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 2 | 25 | 5 | 15 | 0 | 0 | 0 | 0 | 19 | 15 | 7.3 |
| 522 | ? | 1 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 5 | 15 | 2 | 5 | 4 | 5 | 0 | 0 | 5 | 42 | 5.5 |
| 523 | 201-37 | 1 | 0 | 1 | 1 | 0 | 1 | 4 | 0 | 5 | 2 | 2 | 5 | 0 | 0 | 0 | 0 | 1 | 24 | 2.8 |
| 524 | 201-09 | 1 | 1 | 0 | 2 | 2 | 0 | 3 | 0 | 4 | 15 | 5 | 10 | 0 | 0 | 0 | 0 | 5 | 48 | 5.3 |
| 524 | 201-39 | 1 | 1 | 1 | 2 | 2 | 0 | 3 | 5 | 1 | 5 | 4 | 10 | 0 | 0 | 0 | 0 | 3 | 26 | 6.7 |
| 525 | 201-09 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 2 | 10 | 5 | 15 | 4 | 10 | 0 | 0 | 6 | 28 | 5.3 |
| 526 | 201-30 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 2 | 5 | 5 | 15 | 8 | 5 | 0 | 0 | 26 | 60 | 4.4 |
| 527 | 201-49 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 4 | 2 | 5 | 5 | 10 | 4 | 5 | 0 | 0 | 22 | 24 | 3.9 |
| 528 | 201-42 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 5 | 20 | 2 | 10 | 4 | 5 | 8 | 10 | 8 | | 18.3 |
| 529 | 201-18 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 5 | 5 | 4 | 10 | 2 | 2 | 8 | 5 | 21 | 24 | |
| 530 | 204-37 | 1 | 0 | 1 | 2 | 0 | 2 | 3 | 0 | 5 | 20 | 4 | 10 | 0 | 0 | 0 | 0 | 3 | 36 | 3.7 |
| 531 | 201-21 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 5 | 10 | 2 | 5 | 0 | 0 | 0 | 0 | 1 | ? | 2.5 |
| 532 | 204-02 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 5 | 2 | 3 | 8 | 10 | 5 | 10 | 0 | 0 | 2 | 22? | 4.4 |
| 533 | 501-52 | 2 | 0 | 0 | 2 | 0 | 0 | 3 | 1 | 7 | 2 | 2 | 4 | 5 | 10 | 8 | 2 | 4 | >25 | 5.5 |
| 534 | 501-52 | 0 | 0 | 0 | 2 | 0 | 3? | 2 | 1 | 8 | 15 | 5 | 10 | 2 | 10 | 0 | 0 | 15 | 24 | 7.3 |
| 599 | | | | | | | | | | | | | | | | | | | | |
| 990 | | | | | | | | | | | | | | | | | | | | |
| 999 | | | | | | | | | | | | | | | | | | | | |

| NOTES | TYPE |
|---|---|
| 40% medium and coarse mica exterior slip; 40% medium mica interior slip | 500 |
| 5% medium mica in exterior slip; 5% medium mica shows through interior | 501 |
| 5% medium mica exterior, 5% medium mica interior | 502 |
| 5% medium mica in exterior slip | 503 |
| 10% medium mica in exterior slip | 504 |
| 20% fine and medium mica in exterior wash; 20% fine and medium mica interior; very sh | 505 |
| 5% medium mica in exterior slip | 506 |
| 10% medium mica in exterior wash; 10% medium mica visible in interior | 507 |
| 5% fine and medium mica in exterior slip; 5% fine and medium mica visible interior | 508 |
| 5% medium mica in exterior slip; 5% fine mica visible interior; very odd multiple cores | 509 |
| No mica in exterior slip; 20% fine and medium mica visible in interior paste | 510 |
| 5% medium and coarse mica on one side (not clear if exterior or interior); mica wash ov | 511 |
| (replaced by 531 as 512 sherd was missing) | 512 |
| Rim 5-2; 10% fine and medium mica in slip both sides; like 512 with slip on both sides | 513 |
| 50% fine and medium mica in slip both sides | 514 |
| 20% mica visible interior only | 515 |
| Traces of fine mica interior only | 515 |
| 5% fine mica in exterior wash | 516 |
| 30% fine and medium mica in wash | 517 |
| 10% mica in exterior slip; 20% medium and coarse mica visible in interior | 518 |
| 10% mica in exterior slip; 20% medium and coarse mica visible in interior | 518 |
| Rim; 40% medium and coarse mica in wash both sides; very sparkly surfaces | 519 |
| Rim; 20% fine and medium mica in exterior red wash; paste mica shows through abrad | 520 |
| 40% medium and coarse mica in exterior wash; 50% medium and coarse mica in interi | 521 |
| 10% medium mica in exterior slip; 15% fine and medium mica visible in interior | 522 |
| 5% very fine mica in exterior wash; 2% mica visible in interior | 523 |
| 5% fine mica in exterior slip; 10% fine mica in interior slip | 524 |
| 5% mica in fine slip both sides; modern? | 524 |
| 5% medium mica in exterior slip; 15% medium and coarse mica visible in interior | 525 |
| rim; 30% fine and medium mica in wash both sides; very shiny exterior | 526 |
| rim; 10% medium mica in exterior wash; 15% medium mica in interior wash | 527 |
| Handle; 30% fine and medium mica in wash both sides; shiny, powdery exterior; moder | 528 |
| Rim, 5% fine mica in wash both sides | 529 |
| 10% very fine mica in exterior slip | 530 |
| 25% fine and medium mica in exterior wash; 15% fine mica shows in interior; same as 51 | 531 |
| 30% fine mica in exterior wash; 50% fine mica in interior wash | 532 |
| Very fine mica in exterior slip; "mica" in paste could be quartzite | 533 |
| 5% medium mica in exterior slip; 5% mica visible in interior | 534 |
| Micaceous, not further identifiable | 599 |
| Small redware/brownware fragments; otherwise identifiable but very small | 990 |
| Unidentifiable (e.g. lacking both sides, abraded) | 999 |

APPENDIX B

RIM FORMS FROM KAUNDINYAPURA
AND DHAMANTRI

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8-2
54-4
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49-5
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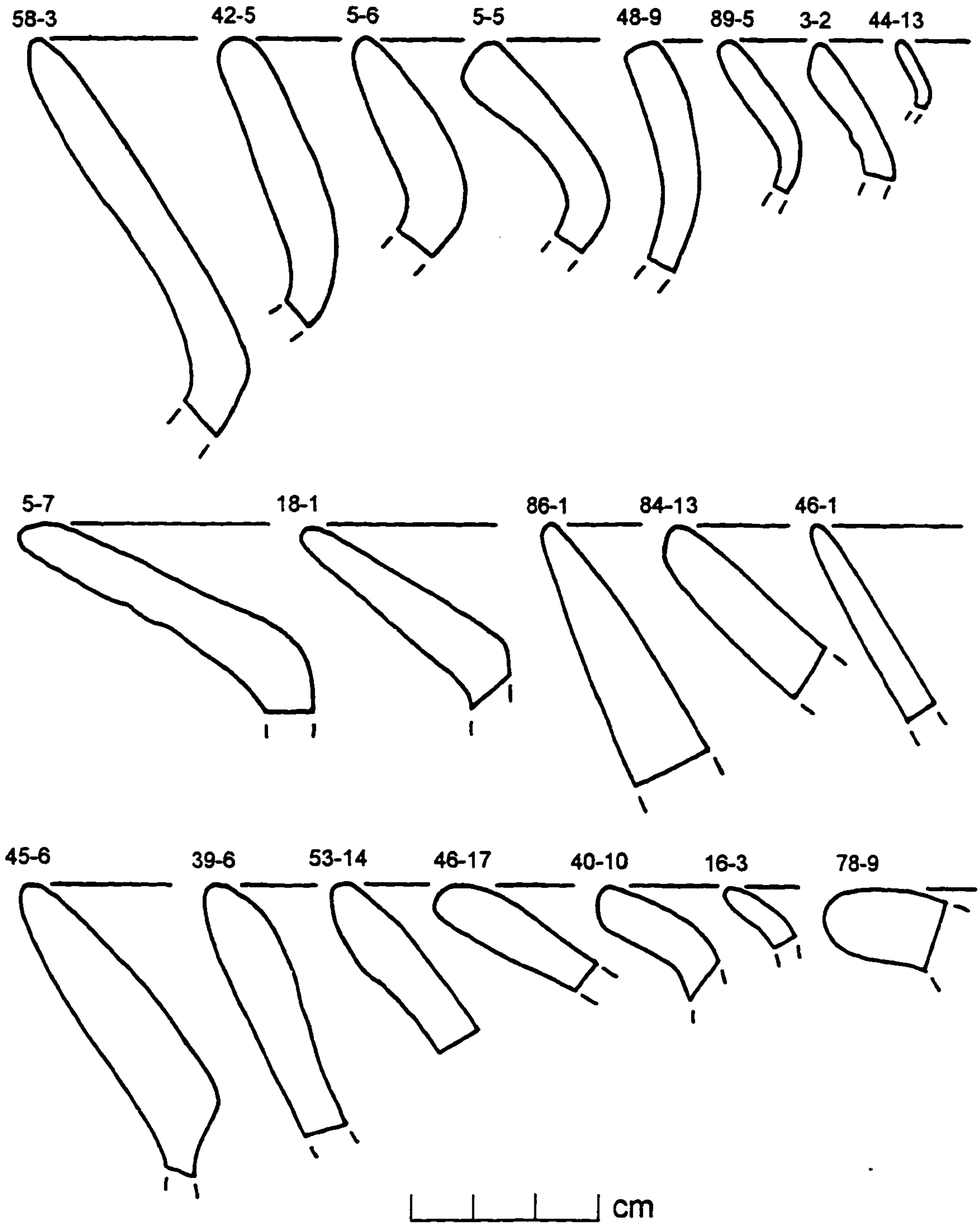
75-10
cm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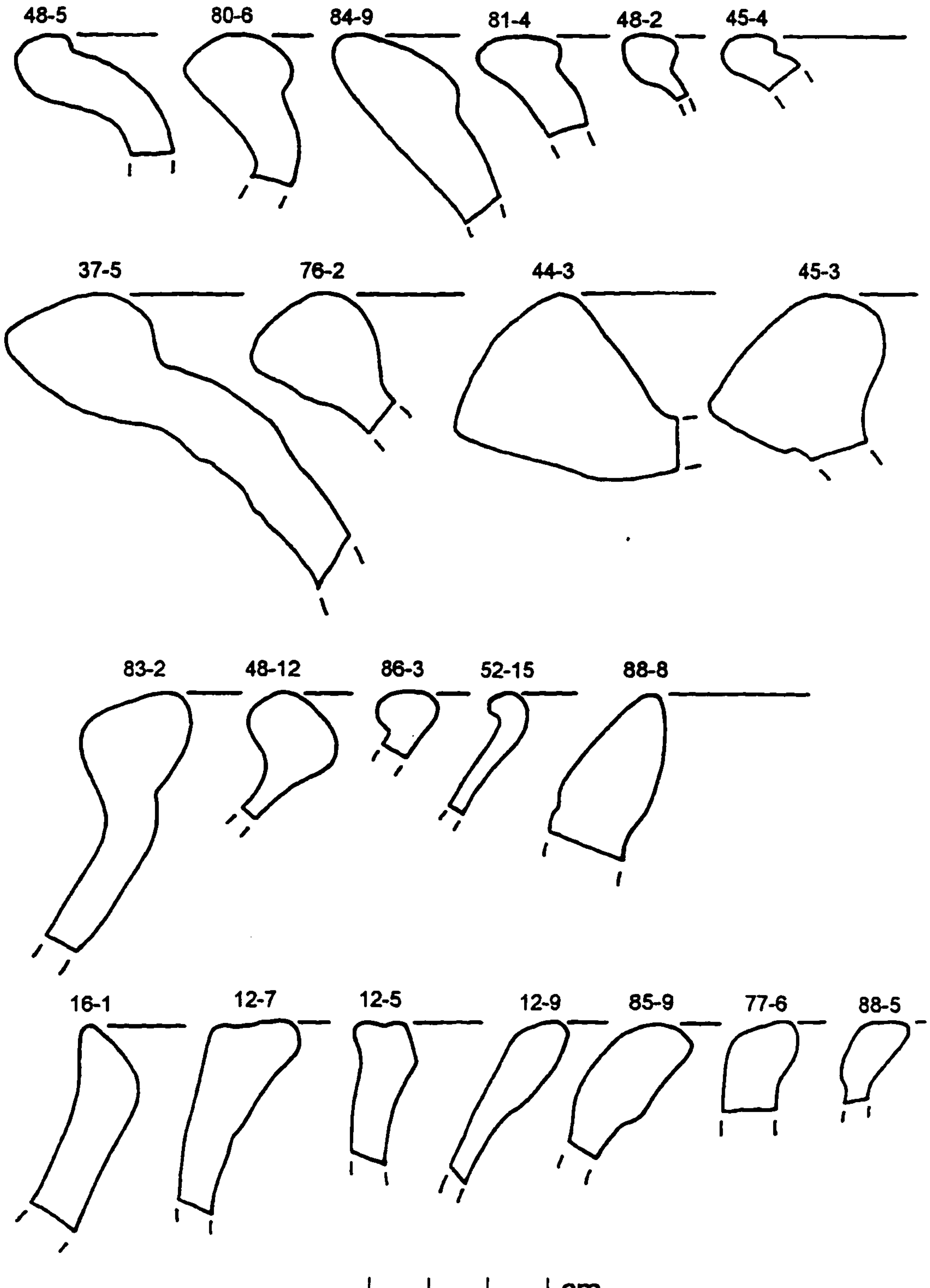
46-17
40-10
16-3
78-9
cm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12-9
85-9
77-6
88-5
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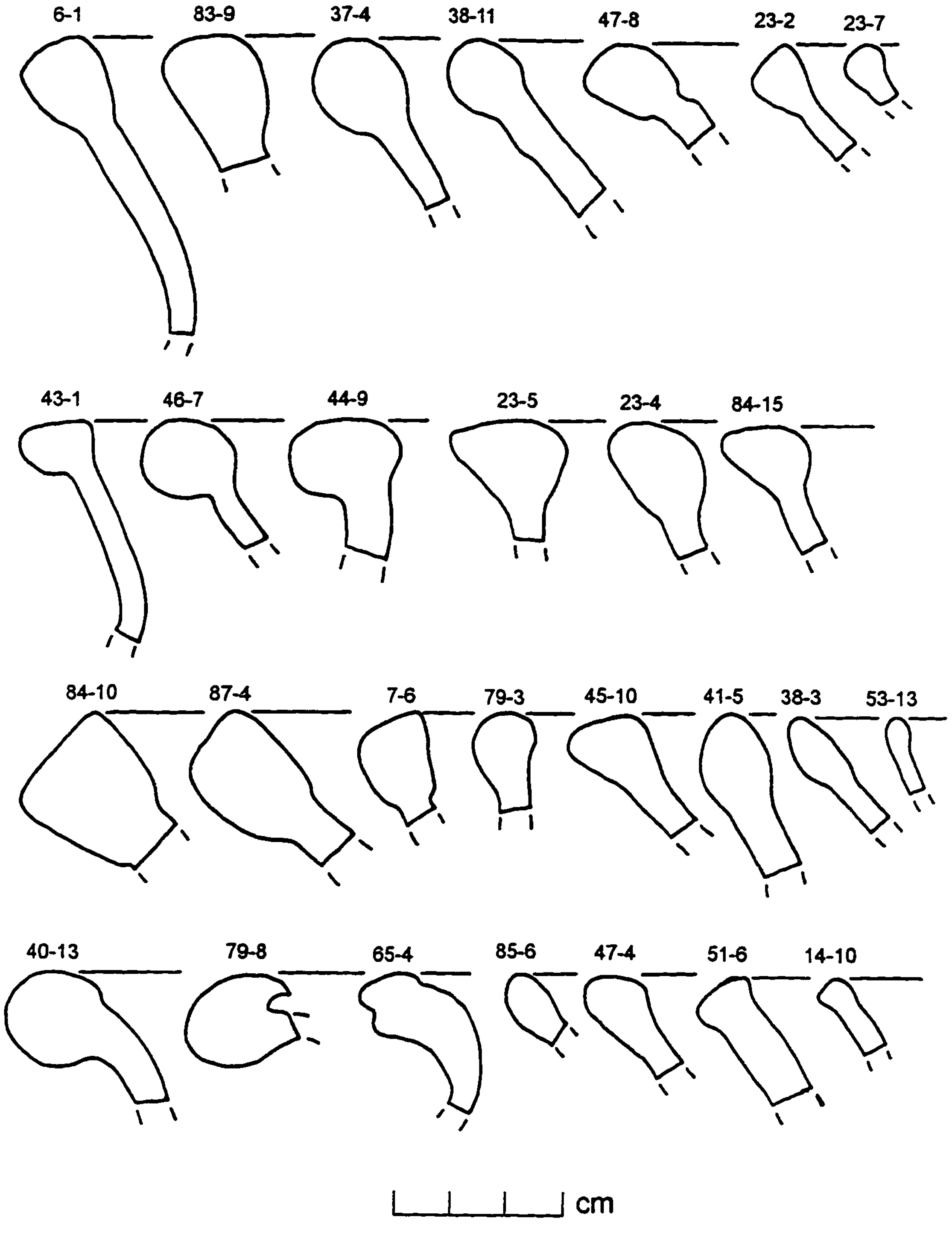
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47-4
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14-10
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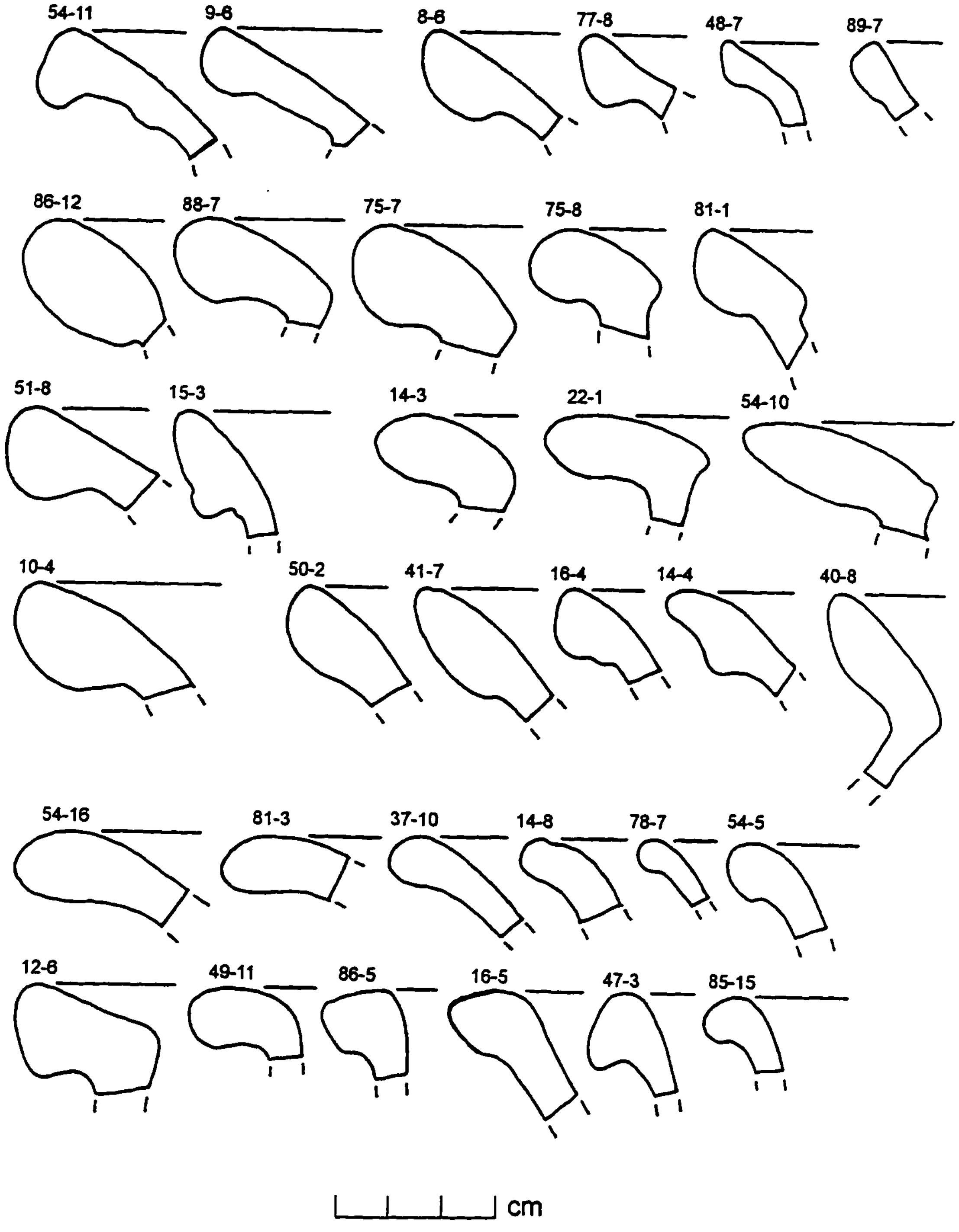
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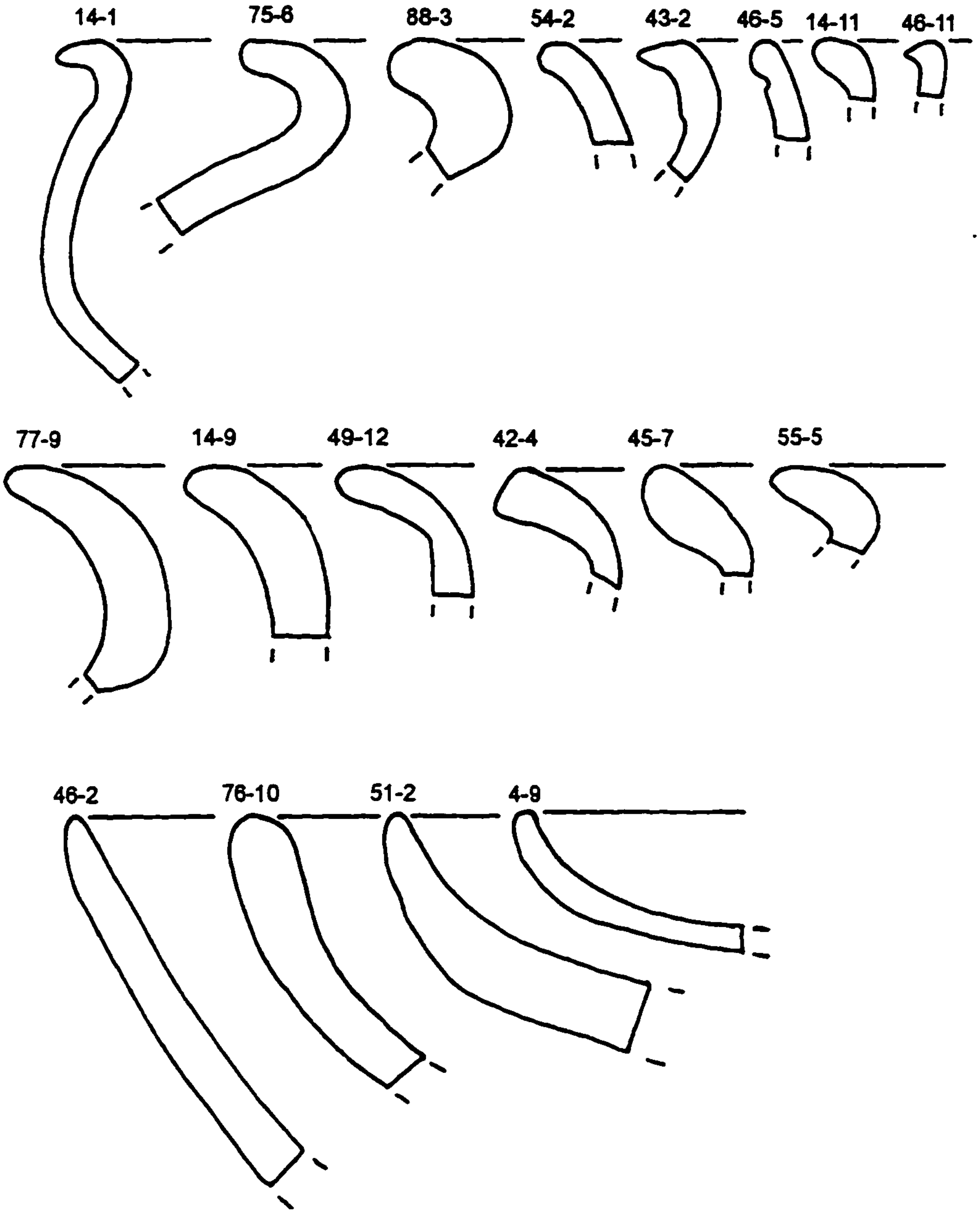
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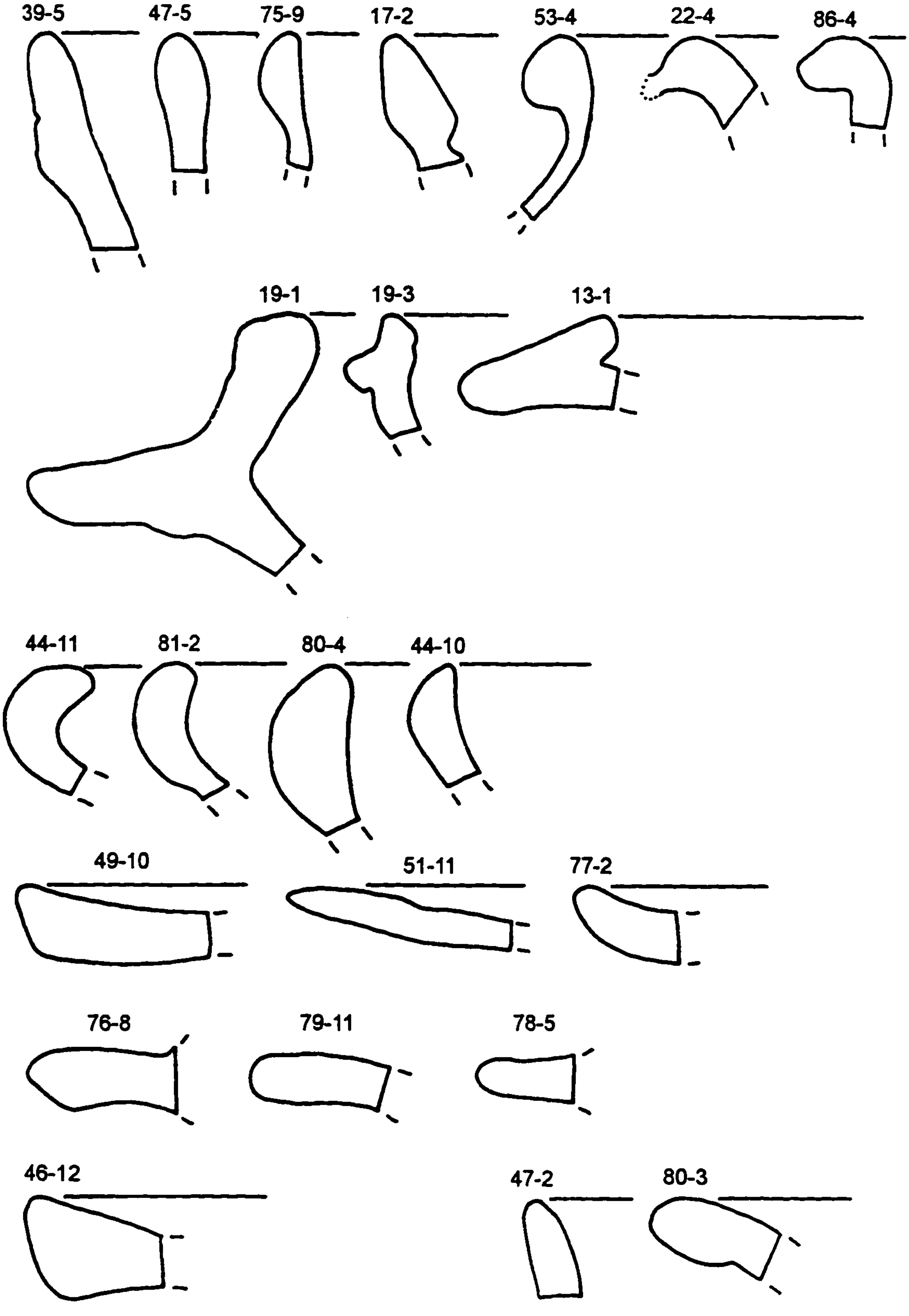
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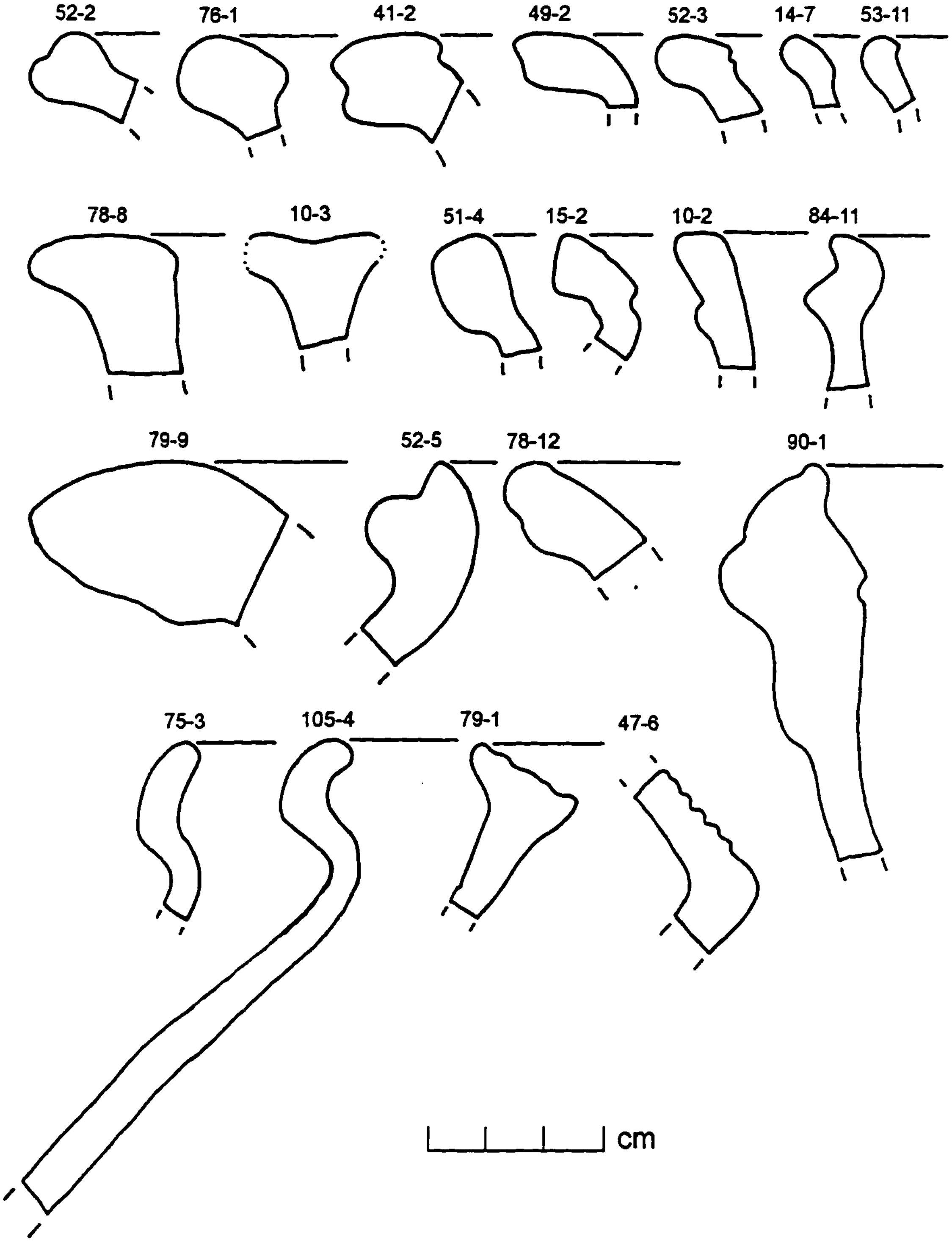
80-3
cm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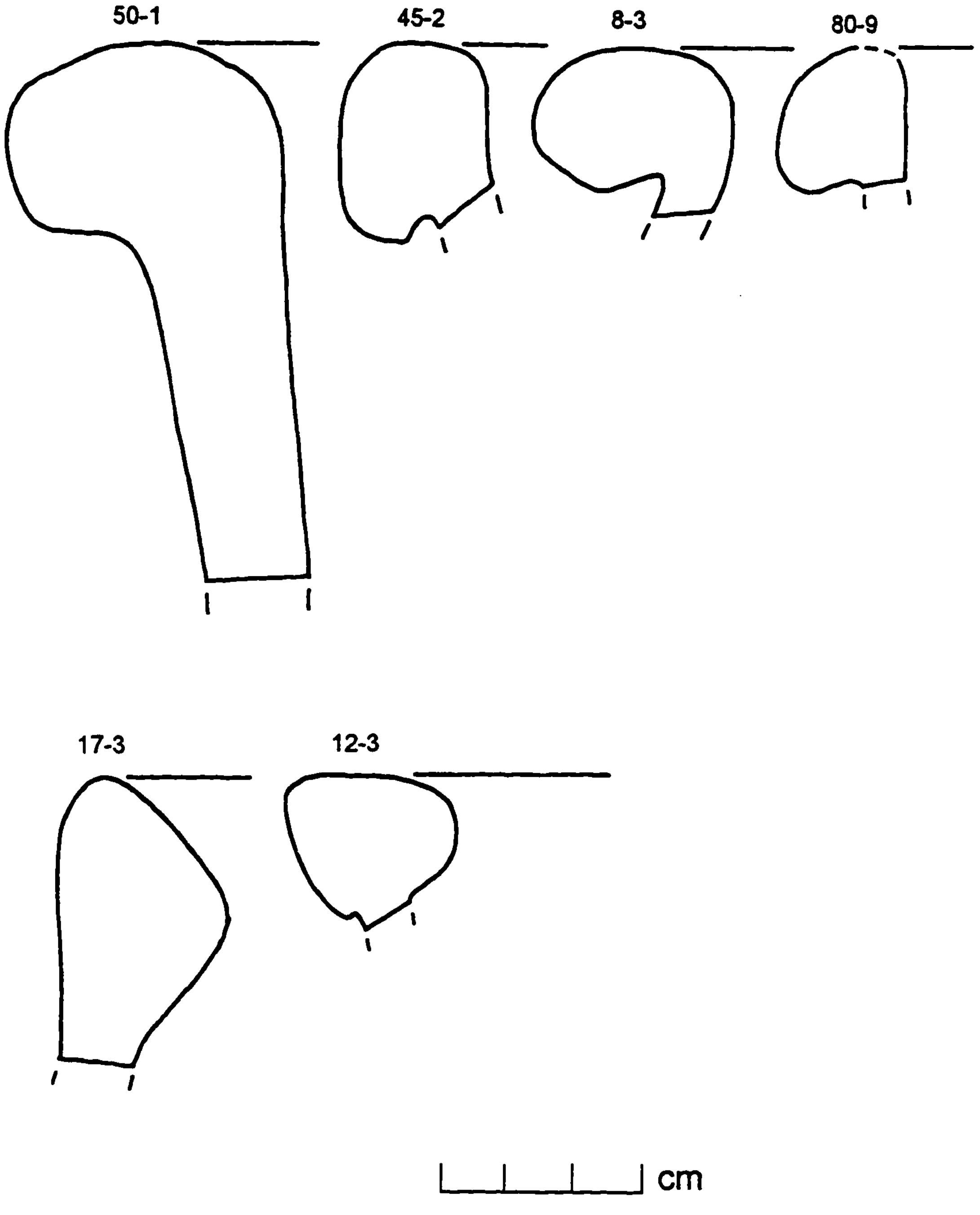
cm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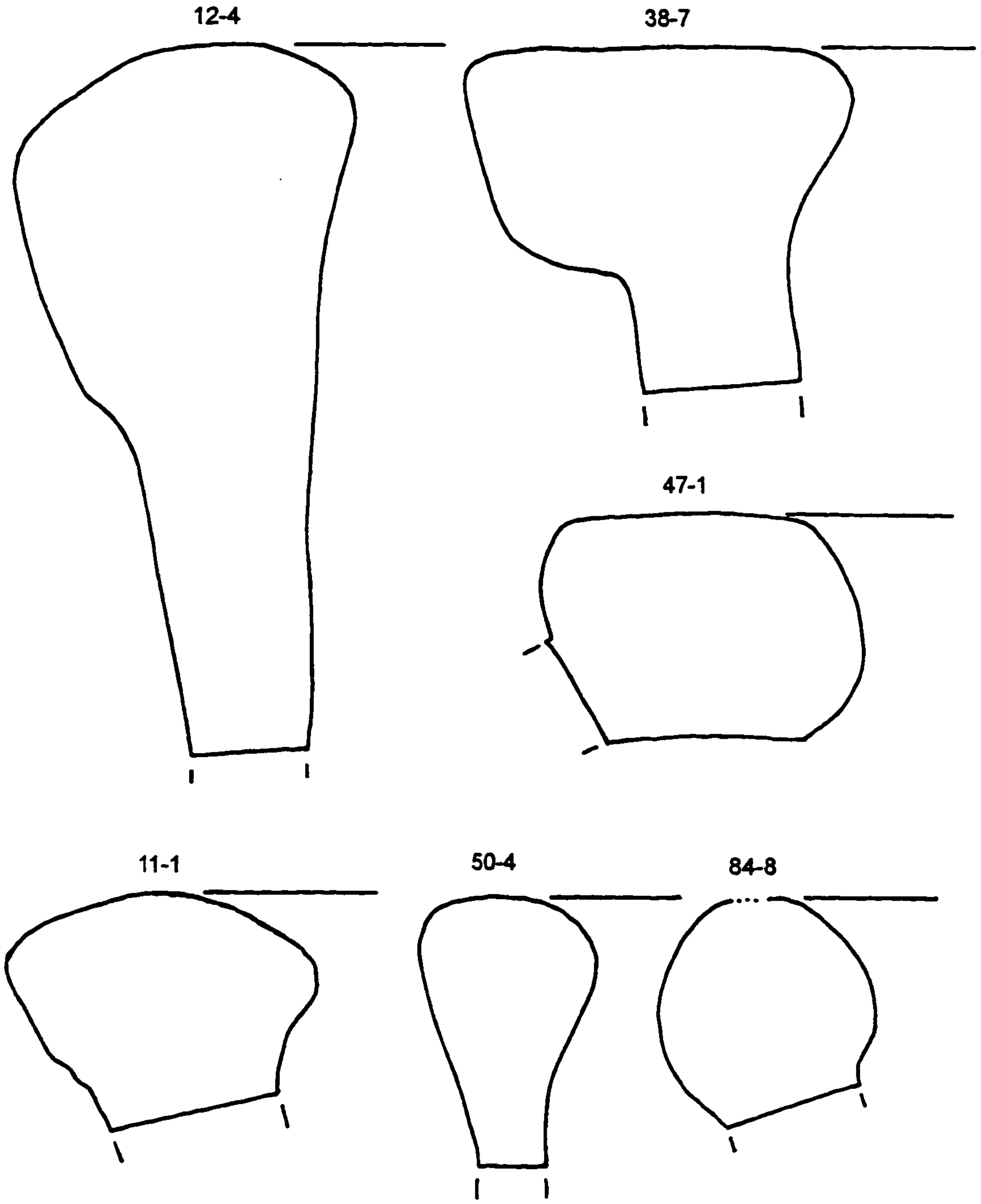
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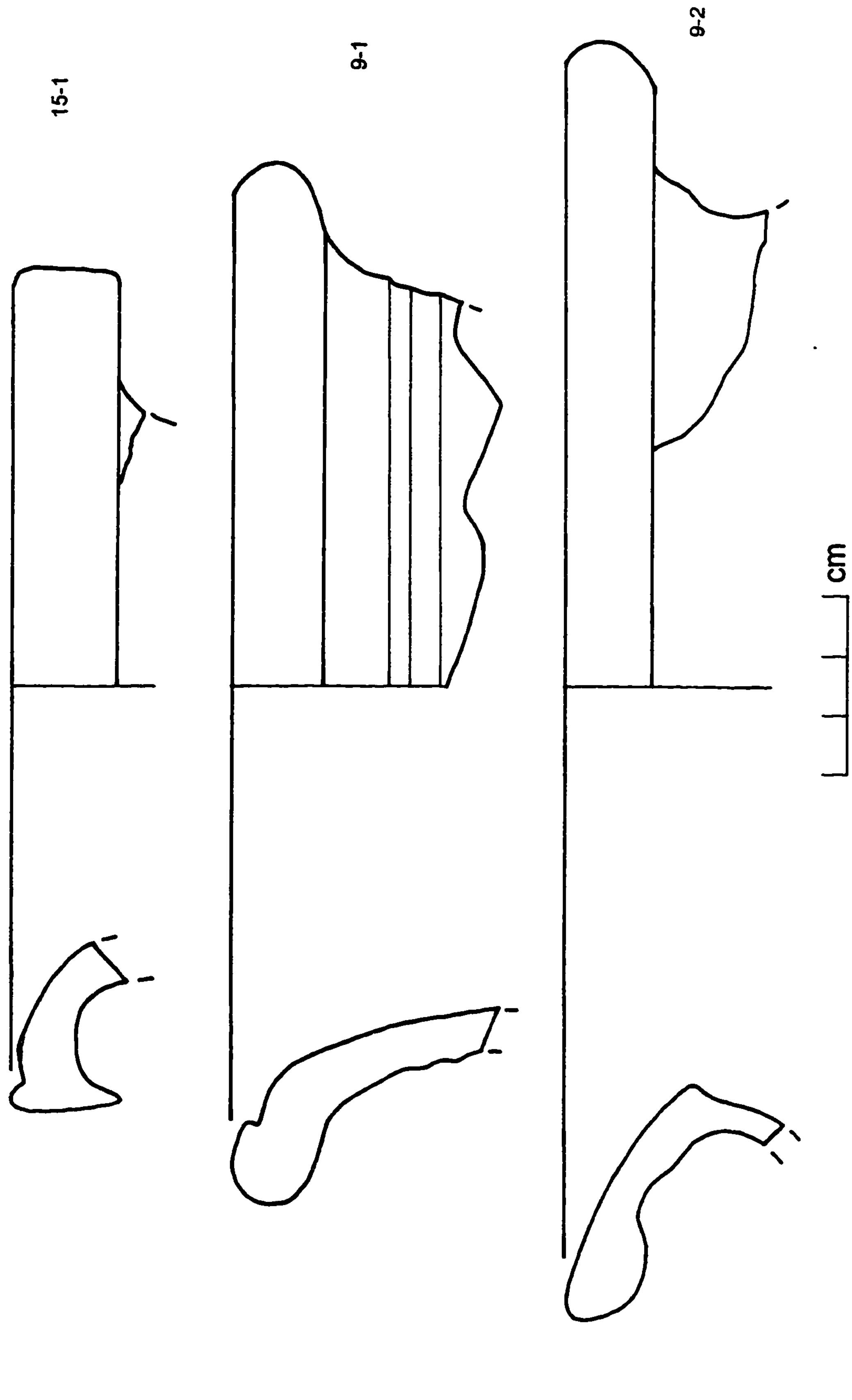
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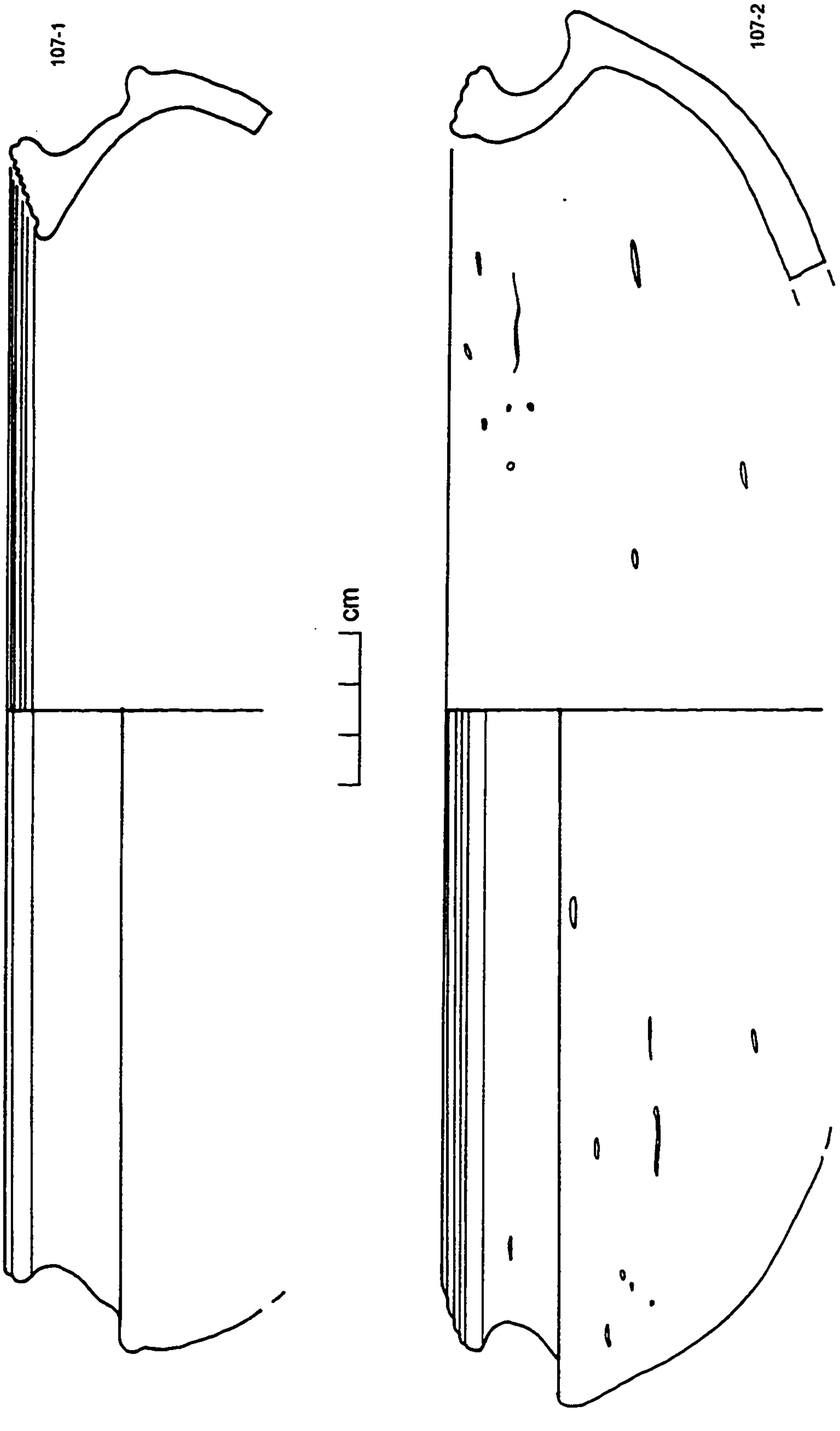
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# APPENDIX C

## FREQUENCIES AND DATES FOR RIM-FORMS FROM KAUNDINYAPURA AND DHAMANTRI

| Rim form | # from Kp | # from Dmt | Source | Description |
|---|---|---|---|---|
| 0-0 | 102 | 3 | | String-cut base |
| 0-1 | 64 | | | |
| 0-2 | 9 | 1 | | |
| 0-4 | 18 | | | |
| 3-0 | 315 | 17 | Raipur, megalith 2 (Deglurkar and Lad 1992, figure 89) | coarse red ware |
| 3-0 | | | Takalghat, phase IC, c. 4th c. BC (Deo 1970, form 35c) | black burnished ware |
| 3-02 | 12 | 1 | Atranjikhera, period IV phase D, 200-500 BC (Gaur 1983) | NBP, fine fabric steel gray in color |
| 3-02 | | | Takalghat, phase IA, c. 7th c. BC (Deo 1970) | black burnished ware, dull black slip |
| 3-08 | 1 | | Kaundinyapura, megalithic period (Dikshit 1968, form 118) | megalithic b&r ware |
| 4-0 | 39 | 1 | | |
| 4-01 | 9 | | Raipur, megalith 2 (Deglurkar and Lad 1992: 74, figure 88) | coarse red ware with reddish brown slip exterior |
| 4-03 | 17 | | | |
| 4-09 | 14 | | | |
| 5-02 | 2 | | | |
| 5-05 | 3 | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 64) | black-and-red ware |
| 5-05 | | | Mahurjhari, megalith 4 loc. 3 (Deo 1973, form 21) | |
| 5-06 | 6 | | Kaundinyapura, megalithic period (Dikshit 1968, form 141a) | chocolate and black slip |
| 5-06 | | | Kaundinyapura, Satavahana period (Dikshit 1968, form 8b) | |
| 5-06 | | | Apegaon, period I, 16th c. BC (Deo, Dhavalikar and Ansari 1979, form 7b) | thick light red ware with (?self) slip |
| 5-06 | | | Apegaon, period II, 15th c. BC (Deo, Dhavalikar and Ansari 1979, form 58) | Malwa ware |
| 5-06 | | | Takalghat, phase IA, 7th c. BC (Deo 1970, form 19) | micaceous red ware |
| 5-06 | | | Mahurjhari, megalith 6 loc. 3 (Deo 1973, form 2) | thick and brittle micaceous red ware |
| 5-06 | | | Paunar, period IIA, 3-4th c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 61B) | coarse micaceous ware with mica temper |
| 5-06 | | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 118c) | |
| 5-07 | 5 | 1 | Paunar, period IIA, 3-4th c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 61A) | coarse micaceous ware with mica temper |
| 5-07 | | | Mahurjhari, megalith 2 (Deo 1973, form 1) | thick and brittle micaceous red ware |
| 6-01 | 61 | 3 | Kaundinyapura, Mauryan (Dikshit 1968, form 25) | common red-ware with dull reddish slip |
| 6-01 | | | Paunar, period I, 1000-800 BC (Deo and Dhavalikar 1968, form 16b) | |
| 6-01 | | | Takalghat, phase 1C, 4th c. BC (Deo 1970, form 91) | painted black-on-red ware |
| 6-01 | | | Raipur, megalith 7 (Deglurkar and Lad 1992:72, figure 82) | micaceous red ware |
| 6-01 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 75E) | red-slipped ware, well-levigated paste; fine surfaces |
| 6-01 | | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, type 92U) | red-slipped ware |
| 7-02 | 1 | | | |
| 7-06 | 4 | | | |
| 8-02 | 2 | | | |
| 8-03 | 2 | | | |
| 8-05 | 2 | | | |
| 8-06 | 31 | | Paunar, period IIA, 3-4th c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 42A) | black burnished ware, gritty and porous core |
| 8-06 | | | Raipur, megalith 6 (Deglurkar and Lad 1992:72, figure 81) | micaceous red ware |
| 8-06 | | | Raipur, megalith 6 (Deglurkar and Lad 1992:72, figure 82) | micaceous red ware |
| 8-06 | | | Raipur, megalith 2 (Deglurkar and Lad 1992:72, figure 88) | coarse red ware |
| 9-01 | 46 | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 75) | red-slipped, well-levigated paste; fine surfaces |

| | | | | |
|---|---|---|---|---|
| 9-01 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 83a) | ware with red wash |
| 9-01 | | | Raipur, megalith 6 (Deglurkar and Lad 1992:72, figure 81) | |
| 9-02 | 6 | | | |
| 9-06 | 7 | | | |
| 10-02 | 1 | | | |
| 10-03 | 1 | | Kaundinyapura, Muslim (Dikshit 1968, form 5) | brick-red clay with medium grits, pale black slip/wash |
| 10-03 | | | Paunar, period IV, 10-11th c. AD to 15-16th c. AD (Deo and Dhavalikar 1968, form | drab black ware, having an extremely gritty core fired dull black |
| 10-04 | 8 | 1 | Kaundinyapura, early Mauryan (Dikshit 1968, form 31) | indifferent firing, pale brown slip |
| 11-01 | 1 | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 115E) | partially red-slipped ware |
| 12-03 | 1 | | | |
| 12-04 | 3 | | | |
| 12-05 | 1 | | | |
| 12-06 | 7 | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 92D) | red-slipped ware |
| 12-07 | 3 | | Kaundinyapura, Satavahana (Dikshit 1968, form 43) | very coarse in underside, very fine burnished slip on exterior |
| 12-08 | 16 | 14 | Raipur, megalith 1, SE quadrant (Deglurkar and Lad 1992, figure 88) | coarse red ware |
| 12-08 | | | Takalghat, phase IB, 4-7th c. BC (Deo 1970, form 72) | matte red ware, clay somewhat gritty |
| 12-09 | 2 | | | |
| 13-01 | 6 | | | |
| 14-01 | 1 | | | |
| 14-03 | 4 | | | |
| 14-04 | 1 | | | |
| 14-07 | 2 | | | |
| 14-08 | 3 | | | |
| 14-09 | 11 | | Takalghat, phase IA, c. 7th c. BC (Deo 1970:18, figure 10) | |
| 14-10 | 4 | | | |
| 14-11 | 11 | | Kaundinyapura, Mauryan (Dikshit 1968, form 181) | red-and-black ware with dull slip interior, bright burnish exterior |
| 14-12 | 1 | | | |
| 15-01 | 1 | | Kaundinyapura, Satavahana (Dikshit 1968, form 35a) | well-levigated clay with chopped straw, pinkish slip on interior |
| 15-01 | | | Kaundinyapura, late Satavahana (Dikshit 1968, form 35b) | well-levigated clay with chopped straw, pinkish slip on interior |
| 15-01 | | | Pauni, period III Satavahana-Kshatrapa, 1-2nd c. AD (Deo and Joshi 1972, form 11 | red-slipped ware of medium fabric |
| 15-01 | | | Mahurjhari, megalith 9 loc. III (Deo 1973, form 22) | mica-slipped red ware |
| 15-02 | 1 | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 137) | Red Polished ware |
| 15-03 | 1 | | | |
| 16-01 | 3 | | | |
| 16-03 | 5 | | Paunar, period IIA, 3-4th c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 55) | coarse red ware, lacking surface treatment, extremely gritty clay |
| 16-03 | | | Pauni, period I Mauryan, 4th-3rd c. BC (Deo and Joshi 1972, form 11A) | fine gray ware, well-levigated |
| 16-04 | 9 | | Pauni, period II, 3rd-1st c. BC Maurya-Sunga (Deo and Joshi 1972, form 48A) | dull red ware |
| 16-04 | | | Pauni, period II, 3rd-1st c. BC Maurya-Sunga (Deo and Joshi 1972, form 47) | medium fabric, with a bright red slip |
| 16-05 | 10 | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 75D) | red-slipped ware generally described as well-levigated with finely-treated surfaces |
| 17-01 | 8 | 1 | Kaundinyapura, late Satavahana (Dikshit 1968, form 112) | red-ware with thick bright red slip all over |
| 17-01 | | | Kaundinyapura, Muslim (Dikshit 1968, form 111) | red-ware with bright red slip all over |
| 17-01 | | | Takalghat, phase IB, 4-7th c. BC (Deo 1970, form 79) | coarse red ware, gritty and with straw inclusions |
| 17-01 | | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 110) | coarse red ware |
| 17-01 | | | Pauni, period I Mauryan 4-3rd c. BC (Deo and Joshi 1972, form 31) | medium fabric, with self-slip |
| 17-02 | 1 | | | |

| | | | | |
|---|---|---|---|---|
| 17-03 | 2 | | ?Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 103/103B) | |
| 18-01 | 22 | 2 | Kaundinyapura, late Satavahana (Dikshit 1968, form 60) | |
| 18-01 | | | Mahurjhari, megalith 9 loc. 3 (Deo 1973, form 19) | mica-slipped red ware, slip of thin powdered mica |
| 18-01 | | | Raipur, megaliths 1, 2, 3, 6, 7, 8 (Deglurkar and Lad 1992, forms 1-16) | micaceous red ware with mica in paste and slip |
| 18-01 | | | Pauni, period III Satavahana-Kshatrapa, 1-2nd c. AD (Deo and Joshi 1972, form 10 | micaceous red ware |
| 18-01 | | | Pauni, period III Satavahana-Kshatrapa, 1-2nd c. AD (Deo and Joshi 1972, form 10 | medium fabric, micaceous red ware |
| 19-01 | 1 | | | |
| 19-03 | 1 | | | |
| 22-01 | 3 | | Takalghat, megalith 2 (Deo 1970, figure 2 K19) | micaceous red ware |
| 22-01 | | | Paunar, period IIA, 4-3rd c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 49A) | red-slipped ware |
| 22-01 | | | Pauni, period III Satavahana-Kshatrapa, 1-2nd c. AD (Deo and Joshi 1972, form 98 | coarse fabric with worn slip |
| 22-01 | | | Pauni, period III Satavahana-Kshatrapa, 1-2nd c. AD (Deo and Joshi 1972, form 98 | medium fabric with bright red slip |
| 22-04 | 1 | | | |
| 23-02 | 2 | | Raipur, megalith 6 (Deglurkar and Lad 1992:74 figure 86) | coarse red ware, reddish brown slip exterior |
| 23-04 | 3 | 2 | | |
| 23-05 | 4 | | | |
| 23-07 | 4 | | | |
| 23-08 | 1 | 1 | | |
| 37-04 | 49 | 3 | Kaundinyapura, late Satavahana (Dikshit 1968, form 28) | chocolate-slipped ware |
| 37-04 | | | Takalghat, phase IB, 4th-7th c. BC (Deo 1970, form 43b) | black burnished ware with gritty core |
| 37-04 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 83) | ware with red wash |
| 37-05 | 20 | | Kaundinyapura, megalithic (Dikshit 1968, form 139) | red ware, pale clay with large amount of chopped straw, red slip interior |
| 37-05 | | | Kaundinyapura, early Mauryan (Dikshit 1968, form 39) | chocolate-slip vessel |
| 37-05 | | | Takalghat, phase IB, 4th-7th c. BC (Deo 1970, form 78) | coarse red ware, gritty with straw |
| 37-05 | | | Takalghat, phase IB, 4th-7th c. BC (Deo 1970, form 30c) | painted black-on-red ware |
| 37-05 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 76) | red slipped ware with finely levigated and finely-slipped surfaces |
| 37-05 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 75G) | red slipped ware with finely levigated and finely-slipped surfaces |
| 37-05 | | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 92E) | red-slipped ware |
| 37-05 | | | Takalghat ____________ (Deo 1970, form 65A) | red-slipped ware, well-fired, pure clay, bright red slip |
| 37-10 | 20 | 1 | | |
| 38-03 | 2 | | | |
| 38-07 | 1 | | Kaundinyapura, late Satavahana (Dikshit 1968, form 37) | coarse pinkish clay with clayee wash |
| 38-09 | 1 | | | |
| 38-11 | 22 | 3 | Paunar, period I, 1000-800 BC (Deo and Dhavalikar 1968, form 16B) | black-burnished ware |
| 39-01 | 1 | | | |
| 39-03 | 1 | | Kaundinyapura, pre-Mauryan (Dikshit 1968, form 99) | coarse red-and-black ware with coarse finish interior, smooth slip exterior |
| 39-03 | | | Kaundinyapura, pre-Mauryan (Dikshit 1968, form 144) | |
| 39-03 | | | Kaundinyapura, pre-Mauryan (Dikshit 1968, form 144a) | |
| 39-03 | | | Kaundinyapura, megalithic (Dikshit 1968, form 146) | |
| 39-05 | 1 | | Kaundinyapura, megalithic (Dikshit 1968, form 147a) | pale yellow slip |
| 39-06 | 6 | 1 | | |
| 39-11 | 1 | | Kaundinyapura, Satavahana (Dikshit 1968, form 81) | |
| 39-11 | | | Kaundinyapura, Satavahana (Dikshit 1968, form 82) | plain red-ware |
| 39-11 | | | Kaundinyapura, Satavahana (Dikshit 1968, form 83) | coarse black-and-red ware vessel |
| 40-02 | 1 | | Kaundinyapura, megalithic (Dikshit 1968, form 123) | chocolate slip |

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|---|---|---|---|---|
| 40-03 | 1 | | | |
| 40-07 | 3 | | | |
| 40-08 | 6 | | Kaundinyapura, Mauryan (Dikshit 1968, form 22) | chocolate slip, coarse gritty clay with a large amount of lime |
| 40-08 | | | Paunar, period IIA, 3-4th c. BC-1st c. BC (Deo and Dhavalikar 1968, form 58b) | coarse black ware |
| 40-10 | 3 | | | |
| 40-13 | 8 | 1 | Pauni, period II, Maurya-Sunga (Deo and Joshi 1972, form 39) | red-slipped ware, medium fabric |
| 41-02 | 1 | | | |
| 41-05 | 5 | | Kaundinyapura, Satavahana (Dikshit 1968, form 15) | coarse gritty clay containing sand and lime; pale brownish slip on exterior only |
| 41-06 | 7 | | | |
| 41-07 | 1 | | | |
| 41-09 | 4 | | | |
| 42-04 | 19 | 1 | | |
| 42-05 | 4 | | Kaundinyapura, megalithic (Dikshit 1968, form 141) | crude red-ware, gritty clay with mica, occasionally with large grits |
| 42-05 | | | Kaundinyapura, Mauryan (Dikshit 1968, form 59) | black-ware |
| 42-05 | | | Kaundinyapura, Satavahana (Dikshit 1968, form 40) | chocolate-slipped ware, fabric coarse with an abundance of lime |
| 42-06 | 2 | | | |
| 43-02 | 1 | | | |
| 44-01 | 1 | | | |
| 44-03 | 1 | | | |
| 44-09 | 1 | | | |
| 44-10 | 3 | | | |
| 44-11 | 4 | | | |
| 44-13 | 2 | | Kaundinyapura, Satavahana (Dikshit 1968, form 193) | well-levigated clay with dull chocolate slip exterior |
| 45-02 | 2 | | | |
| 45-03 | 11 | | Kaundinyapura, megalithic (Dikshit 1968, form 140) | red slip interior, pale chocolate/drab slip exterior |
| 45-04 | 3 | | | |
| 45-06 | 1 | | Kaundinyapura, Mauryan (Dikshit 1968, form 58) | mica as slip on exterior only |
| 45-06 | | | Kaundinyapura, Satavahana (Dikshit 1968, form 58c) | profuse use of mica giving the vessel a very silvery appearance |
| 45-07 | 7 | | | |
| 45-10 | 1 | | | |
| 46-01 | 7 | | | |
| 46-02 | 22 | | Kaundinyapura, Mauryan (Dikshit 1968, form 117) | coarse black-and-red ware, crackling red slip |
| 46-04 | 1 | | Kaundinyapura, megalithic (Dikshit 1968, form 128) | megalithic black-and-red ware, highly burnished |
| 46-04 | | | Kaundinyapura, megalithic (Dikshit 1968, form 128a) | megalithic black-and-red ware, highly burnished |
| 46-05 | 2 | | | |
| 46-07 | 2 | | | |
| 46-08 | 1 | | | |
| 46-09 | 202 | 3 | Kaundinyapura, megalithic (Dikshit 1968, form 127) | megalithic black-and-red ware |
| 46-09 | | | Kaundinyapura, pre-Mauryan (Dikshit 1968, form 101b) | |
| 46-09 | | | Kaundinyapura, ?Mauryan (Dikshit 1968, form 100) | yellowish pottery, well-levigated clay |
| 46-09 | | | Kaundinyapura, Mauryan (Dikshit 1968, form 106) | black-and-red ware with thin smooth slip, carefully finished |
| 46-09 | | | Kaundinyapura, late Satavahana (Dikshit 1968, form 54) | coarse clay with soot slip interior |
| 46-09 | | | Raipur, megalith 3 (Deglurkar and Lad 1992:73, figure 85) | coarse red ware, somewhat porous, reddish brown slip exterior |
| 46-11 | 2 | | | |
| 46-12 | 4 | | | |

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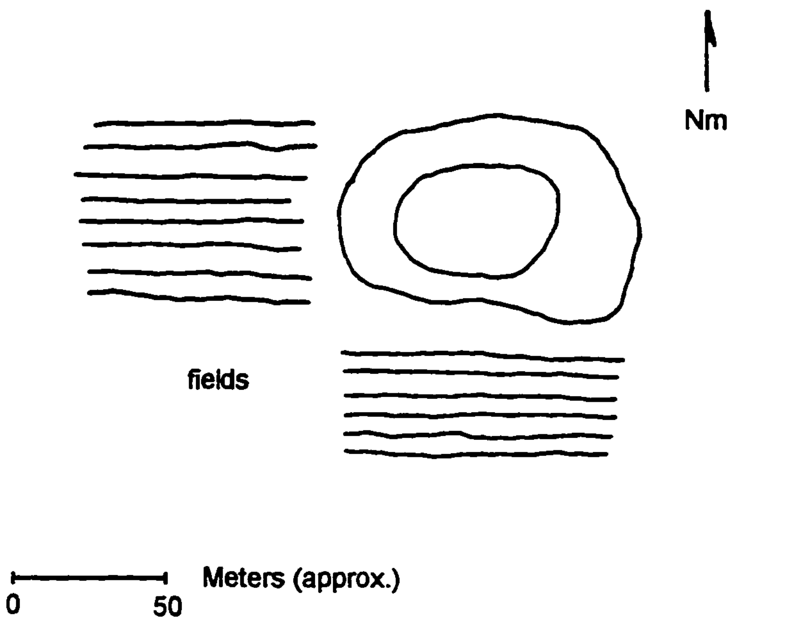
|---|---|---|---|---|
| 46-17 | 2 | | | |
| 47-01 | 1 | | | |
| 47-02 | 55 | 10 | | |
| 47-03 | 2 | | Kaundinyapura, Satavahana (Dikshit 1968, form 168) | red-ware with reddish slip interior |
| 47-04 | 1 | | | |
| 47-05 | 4 | 1 | | |
| 47-06 | 1 | | | |
| 47-08 | 1 | | | |
| 48-02 | 1 | | | |
| 48-03 | 2 | | | |
| 48-05 | 6 | | | |
| 48-07 | 4 | | | |
| 48-09 | 3 | | | |
| 48-12 | 1 | | | |
| 49-02 | 1 | | | |
| 49-05 | 1 | | | |
| 49-06 | 1 | | | |
| 49-08 | 1 | | | |
| 49-11 | 11 | 1 | | |
| 49-12 | 1 | | | |
| 49-13 | 1 | | | |
| 50-01 | 1 | | | |
| 50-02 | 2 | | | |
| 50-04 | 1 | | | |
| 51-02 | 1 | 1 | | |
| 51-04 | 1 | | | |
| 51-06 | 8 | | | |
| 51-08 | 11 | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar 1968, form 92b) | red-slipped ware |
| 51-11 | 32 | | | |
| 51-12 | 1 | | | |
| 52-02 | 1 | | | |
| 52-03 | 1 | | | |
| 52-05 | 1 | | | |
| 52-06 | 1 | | Kaundinyapura, Mauryan or Satavahana (Dikshit 1968, form 92) | |
| 52-10 | 1 | | | |
| 52-15 | 2 | | | |
| 52-16 | 1 | | Kaundinyapura, megalithic (Dikshit 1968, form 136) | crude brick-like pottery |
| 52-16 | | | Kaundinyapura, Muslim (Dikshit 1968, form 110) | red ware with pale reddish slip |
| 53-01 | 3 | | | |
| 53-04 | 3 | 1 | | |
| 53-05 | 1 | 1 | | |
| 53-08 | 1 | | Kaundinyapura, Mauryan (Dikshit 1968, form 65) | great profusion of mica; mica also mixed into clay |
| 53-10 | 19 | 1 | Kaundinyapura, late Satavahana (Dikshit 1968, form (104) | black-and-red ware, smoothly finished |
| 53-11 | 1 | | | |
| 53-13 | 1 | | | |

| | | | | |
|---|---|---|---|---|
| 53-14 | 1 | | | |
| 54-02 | 4 | | | |
| 54-04 | 3 | | | |
| 54-05 | 5 | | | |
| 54-10 | 1 | | Kaundinyapura, Mauryan (Dikshit 1968, form 173) | coarse reddish clay with deep chocolate slip containing minute particles of mica |
| 54-11 | 3 | | | |
| 54-12 | 3 | | | |
| 54-16 | 2 | | | |
| 55-04 | 1 | | | |
| 55-05 | | 1 | | |
| 75-03 | 1 | | | |
| 75-06 | 4 | | | |
| 75-07 | 3 | | Kaundinyapura, Satavahana (Dikshit 1968, form 17) | common red-ware with bright red slip all over |
| 75-08 | 4 | | | |
| 75-09 | 2 | | | |
| 75-10 | 2 | | | |
| 76-01 | 1 | | | |
| 76-02 | 11 | 1 | | |
| 76-08 | 3 | | | |
| 76-10 | 49 | 2 | Kaundinyapura, Satavahana/late Satavahana (Dikshit 1968, form 116b) | coarse black-and-red ware |
| 76-10 | | | Kaundinyapura, late Satavahana (Dikshit 1968, form 88) | coarse black-and-red ware |
| 76-10 | | | Takalghat, phase IA, c. 7th c. BC (Deo 1970, form 20) | micaceous red ware, brittle with mica-flakes |
| 76-10 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 86) | coarse red ware |
| 77-02 | 1 | | | |
| 77-06 | 1 | | | |
| 77-08 | 10 | 3 | | |
| 77-09 | 3 | | Kaundinyapura, Mauryan or later (Dikshit 1968, form 63) | extremely coarse fabric with sprinkling of mica on exterior |
| 77-09 | | | Kaundinyapura, Satavahana (Dikshit 1968, form 58b) | |
| 77-13 | 2 | | | |
| 78-05 | 3 | | | |
| 78-07 | 2 | | | |
| 78-08 | 1 | | | |
| 78-09 | 6 | | Kaundinyapura, late Satavahana (Dikshit 1968, form 20) | chocolate ware with burnished slip all over |
| 78-12 | 1 | | | |
| 79-01 | 2 | | | |
| 79-03 | 1 | | | |
| 79-05 | 2 | | Kaundinyapura, megalithic (Dikshit 1968, form 128b) | |
| 79-05 | | | Kaundinyapura, megalithic (Dikshit 1968, form 129) | megalithic black-and-red ware |
| 79-05 | | | Kaundinyapura, megalithic (Dikshit 1968, form 130a) | |
| 79-05 | | | Kaundinyapura, megalithic (Dikshit 1968, form 131) | megalithic black-and-red ware |
| 79-08 | 1 | | | |
| 79-09 | 1 | | | |
| 79-11 | 1 | | | |
| 79-12 | 1 | | | |
| 80-02 | 2 | | | |

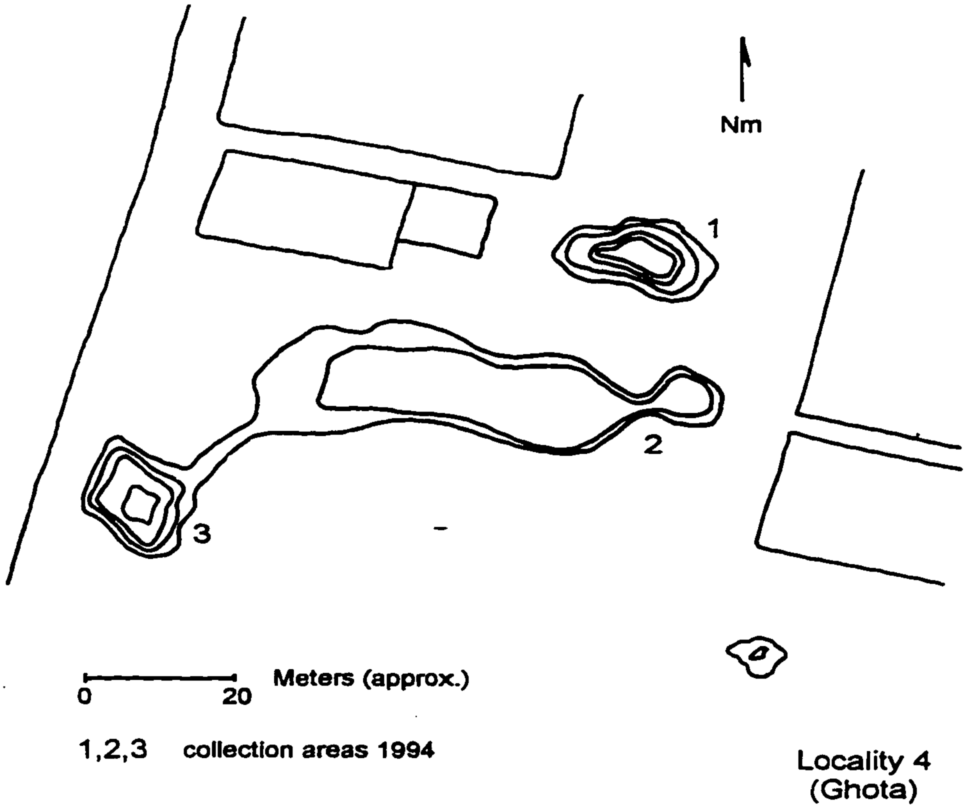
| | | | | |
|---|---|---|---|---|
| 80-03 | 1 | | Paunar, period III, 3-8th c. AD (Deo and Dhavalikar, form 91D) | red-slipped ware |
| 80-04 | 3 | | | |
| 80-06 | 1 | | | |
| 80-09 | 1 | | | |
| 80-11 | 1 | | | |
| 81-01 | 6 | 1 | | |
| 81-02 | 3 | | | |
| 81-03 | 3 | 1 | | |
| 81-04 | 2 | | | |
| 81-15 | 8 | 7 | | |
| 83-02 | 2 | | | |
| 83-09 | 1 | | Kaundinyapura, Mauryan (Dikshit 1968, form 26a) | |
| 84-01 | 1 | | Kaundinyapura, Mauryan (Dikshit 1968, form 26) | chocolate ware with dull slip |
| 84-06 | | 1 | | |
| 84-07 | 1 | 1 | | |
| 84-08 | | 1 | | |
| 84-09 | | 1 | | |
| 84-10 | 1 | 1 | | |
| 84-11 | | 1 | | |
| 84-13 | 13 | 5 | Takalghat, phase IA, c. 7th c. BC (Deo 1970, form 19b) | micaceous red ware |
| 84-13 | | | Takalghat, phase IB, c. 7th c. BC (Deo 1970, form 57) | micaceous red ware |
| 84-13 | | | Takalghat, phase IB, c. 7th c. BC (Deo 1970, form 57a) | micaceous red ware |
| 84-13 | | | Paunar, period IIA, 3-4th c. BC to 1st c. BC (Deo and Dhavalikar 1968, form 61) | coarse micaceous ware |
| 84-13 | | | Paunar, period IIB, 1st c. BC to 2-3rd c. AD (Deo and Dhavalikar 1968, form 88) | black-slipped micaceous ware |
| 84-15 | | 1 | | |
| 85-06 | | 1 | | |
| 85-09 | | 1 | | |
| 85-11 | | 1 | | |
| 85-15 | 1 | 2 | | |
| 86-01 | | 3 | Kaundinyapura, megalithic (Dikshit 1968, form 79) | coarse gritty clay with a large amount of chopped straw |
| 86-03 | | 1 | | |
| 86-04 | | 1 | | |
| 86-05 | | 1 | Kaundinyapura, Mauryan (Dikshit 1968, form 174) | well-levigated light clay with dark red paint exterior and on neck interior |
| 86-12 | | 1 | | |
| 86-13 | | 1 | | |
| 86-15 | 2 | 1 | | |
| 87-04 | 1 | | | |
| 88-03 | | 1 | Kaundinyapura, Muslim (Dikshit 1968, form 34) | pale chocolate ware with deep chocolate slip exterior and up to carination interior |
| 88-06 | 1 | | | |
| 89-05 | 1 | | Kaundinyapura, Mauryan/Satavahana (Dikshit 1968, form 41) | pale brownish slip interior, dark slip on the interior |
| 89-07 | 1 | | | |
| 90-01 | | | | |
| 105-04 | 1 | | | |
| 107-01 | 1 | | | |
| 107-02 | 1 | | | |

APPENDIX D

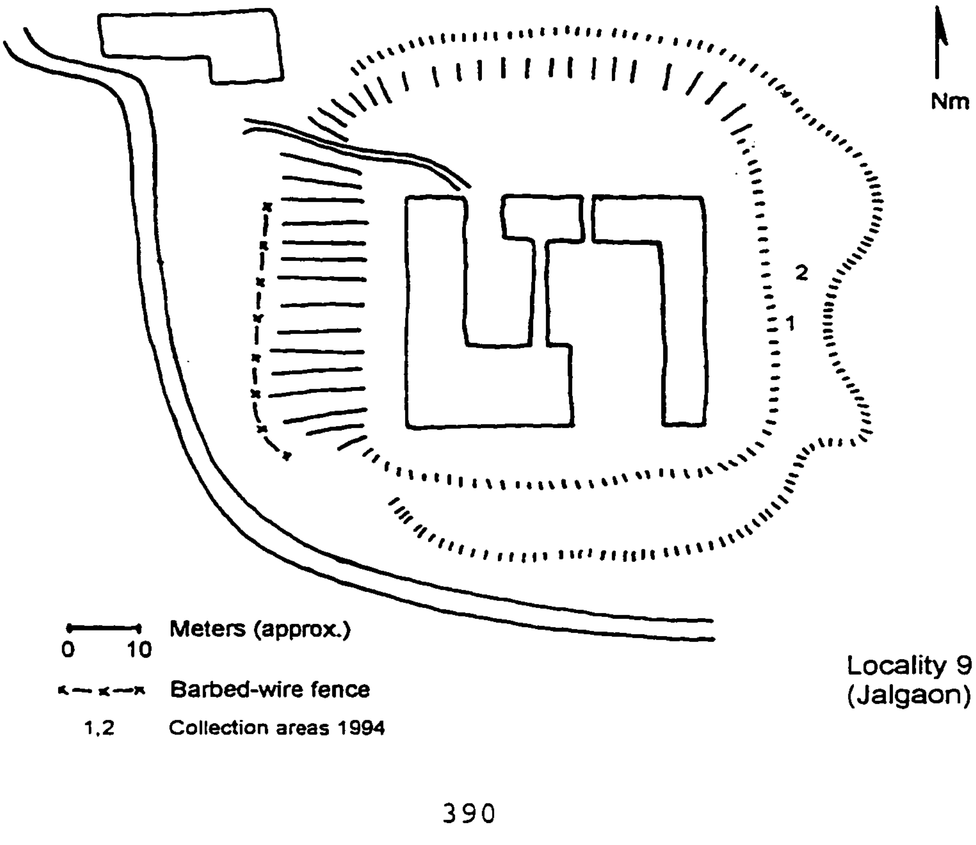
MAPS OF SURVEY SITES
IN THE AREA AROUND KAUNDINYAPURA



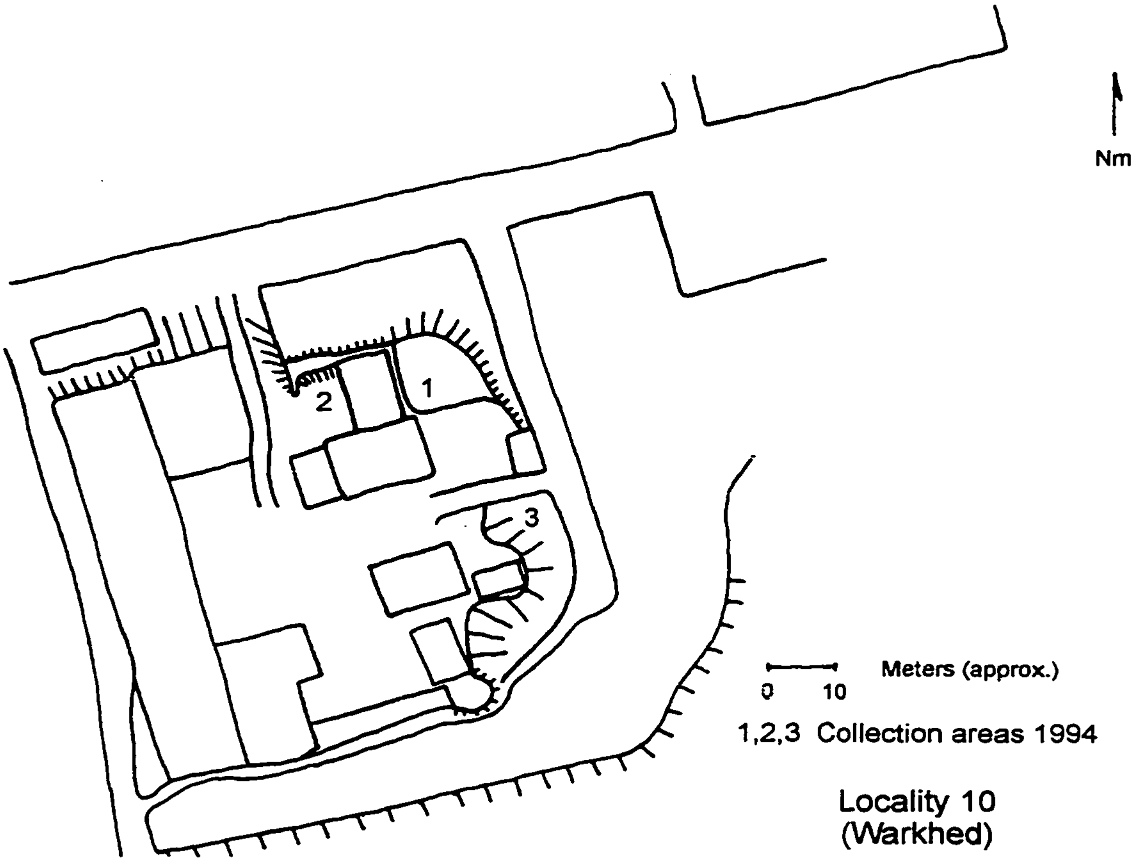

Locality 1
(Kharoji Maharaja mandir)

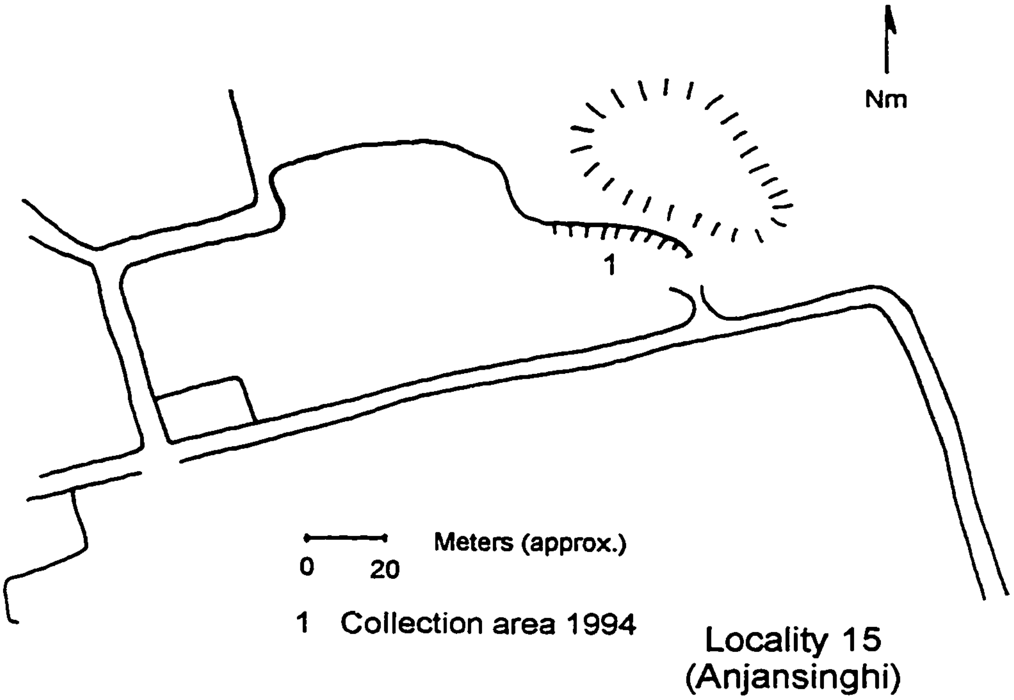


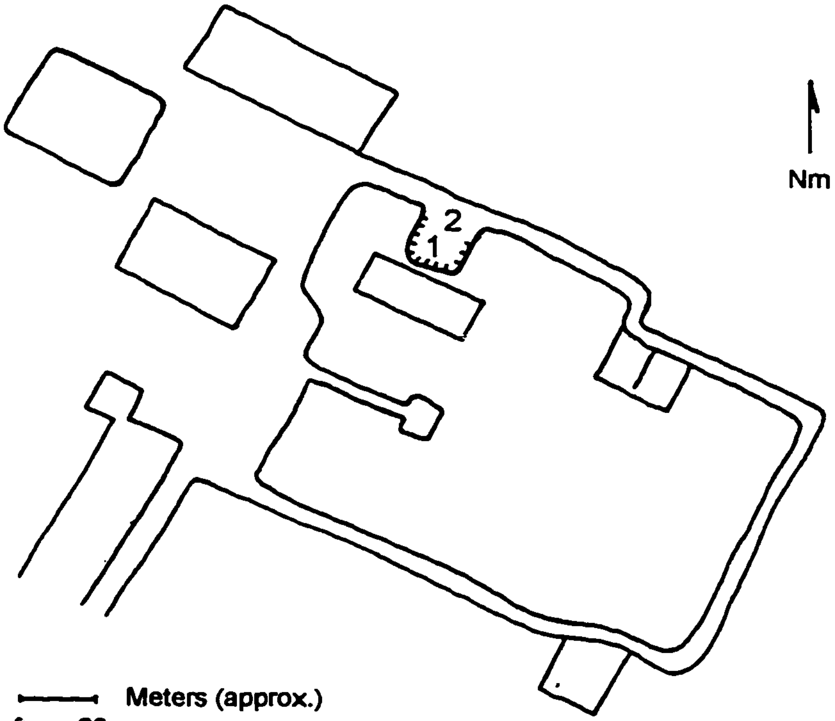
Nm
1
2
3
Meters (approx.)
0
20
1,2,3 collection areas 1994
Locality 4
(Ghota)

Nm
2
1
Meters (approx.)
0 10
Barbed-wire fence
1,2 Collection areas 1994
Locality 9
(Jalgaon)


Nm
1
2
3
0 10 Meters (approx.)
1,2,3 Collection areas 1994
Locality 10
(Warkhed)

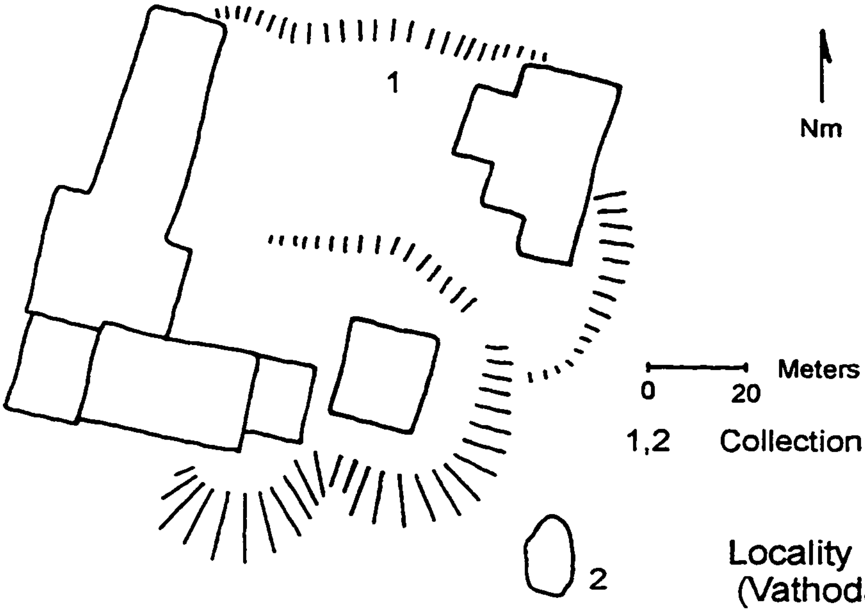

Nm
1
0 20 Meters (approx.)
1 Collection area 1994
Locality 15
(Anjansinghi)




Meters (approx.)
0 20

1,2 Collection areas 1994

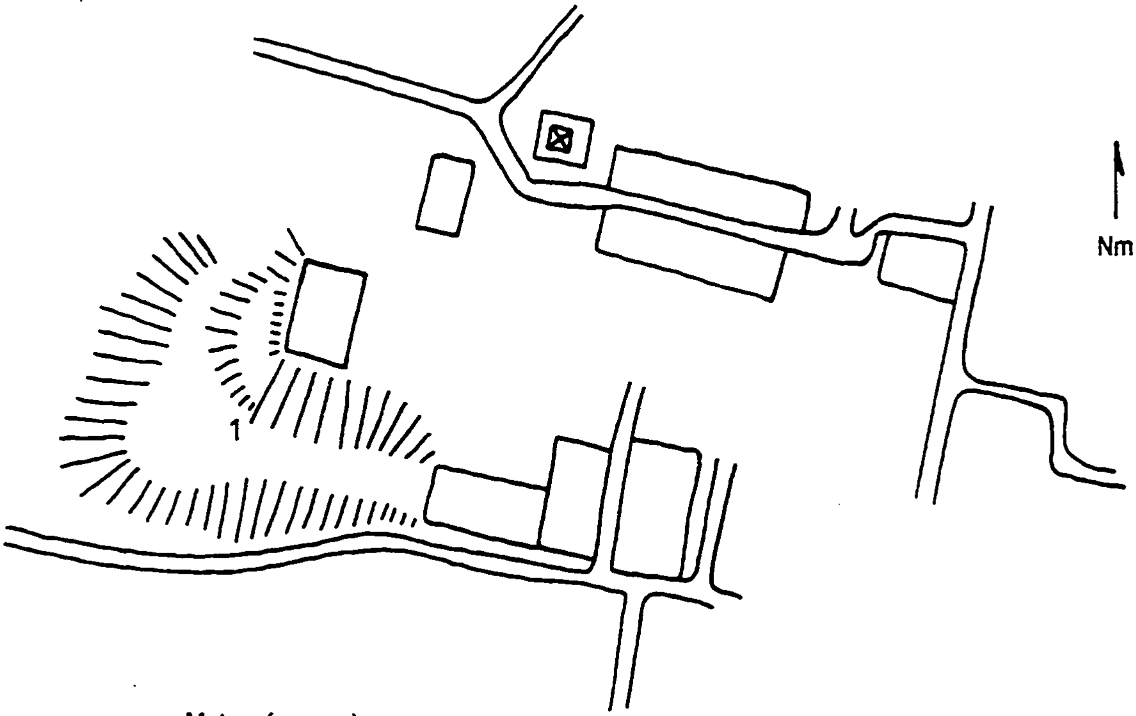
**Locality 16**
**(Pipalkhuta)**




Meters (approx.)
0 20

1,2 Collection areas 1994

**Locality 17**
**(Vathoda)**

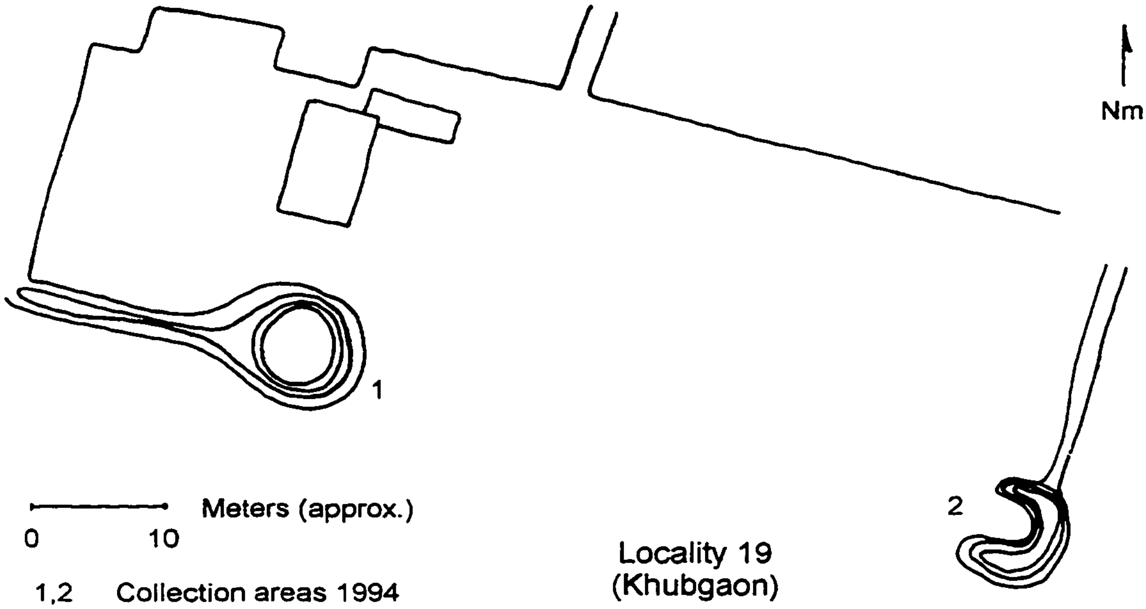



Meters (approx.)
0 10

Temple

1 Collection area 1994

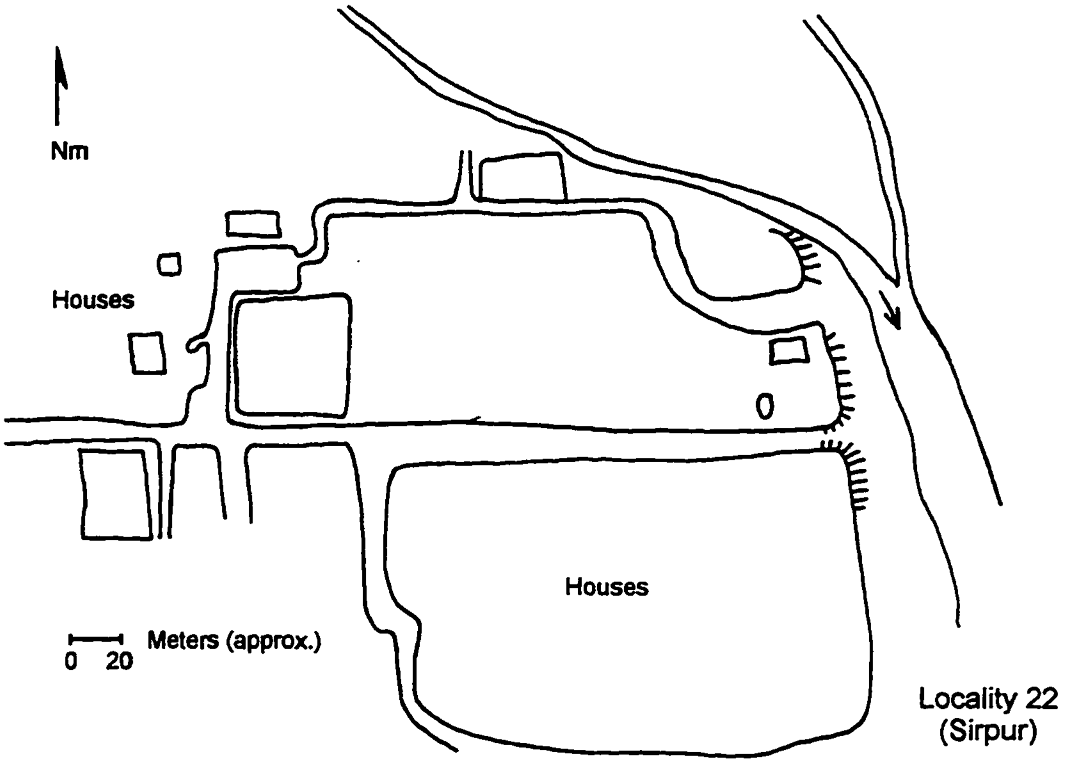
Locality 18
(Nimboli)

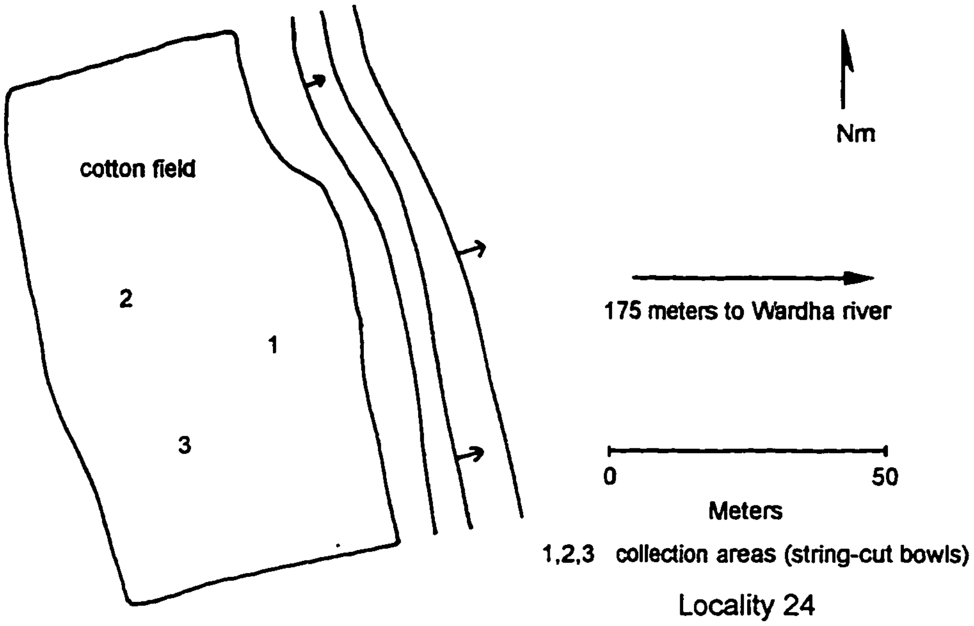


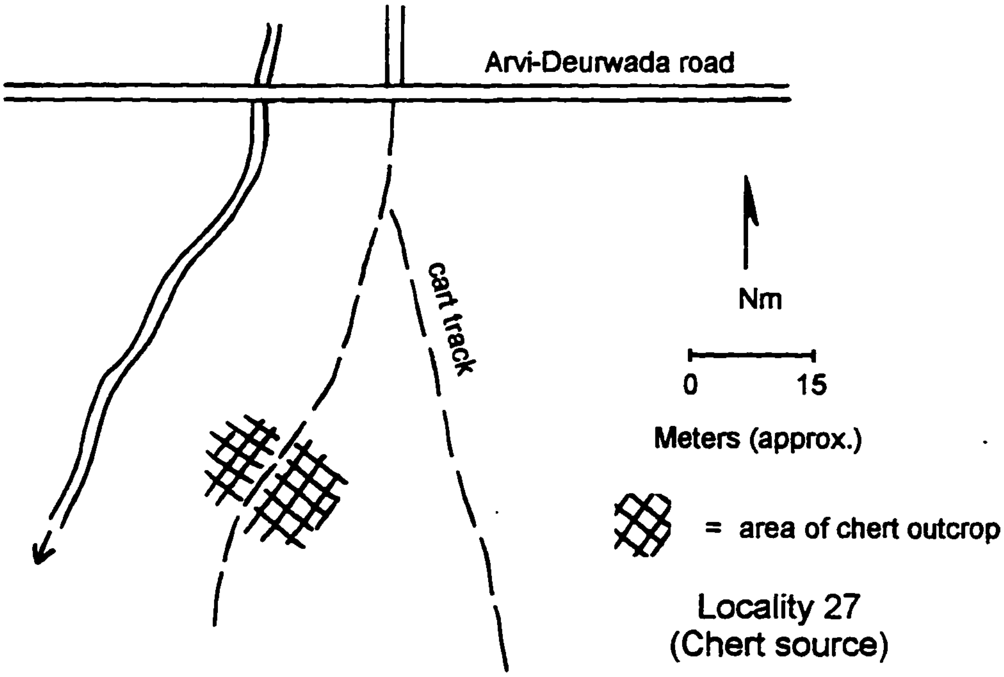

Meters (approx.)
0 10

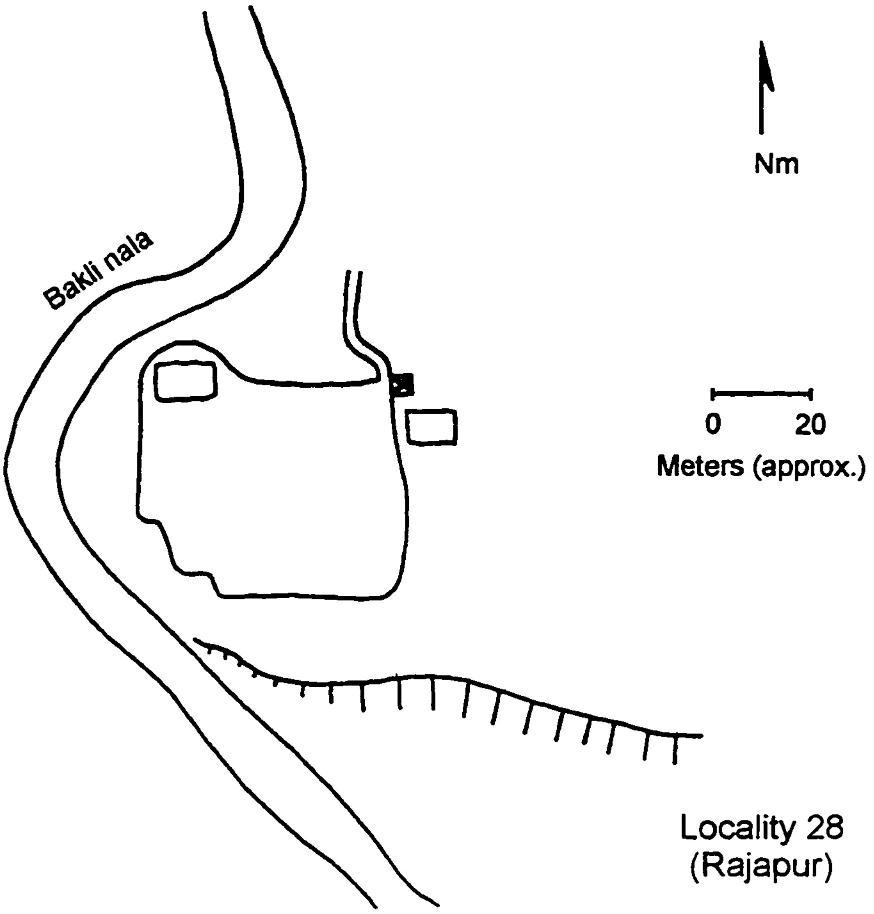
1,2 Collection areas 1994

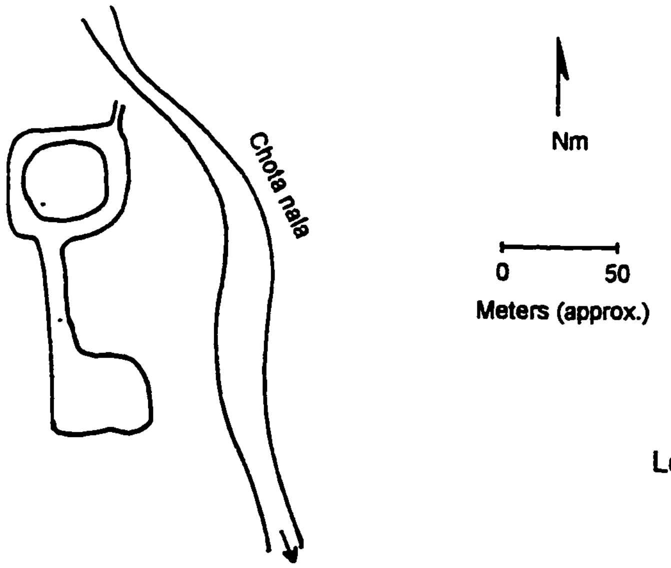
Locality 19
(Khubgaon)


Nm
Houses
0
Houses
Meters (approx.)
0 20
Locality 22
(Sirpur)

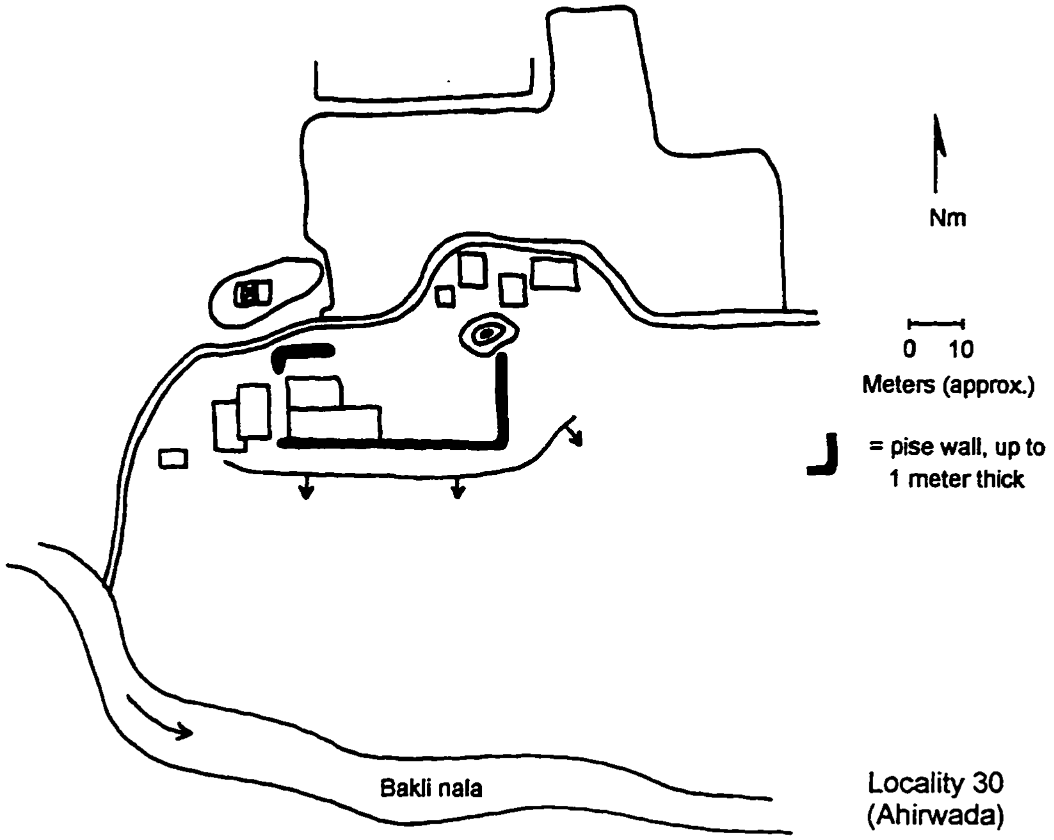

Nm
cotton field
2
1
3
175 meters to Wardha river
0
50
Meters
1,2,3 collection areas (string-cut bowls)
Locality 24


Arvi-Deurwada road
cart track
Nm
0 15
Meters (approx.)
= area of chert outcrop
Locality 27
(Chert source)

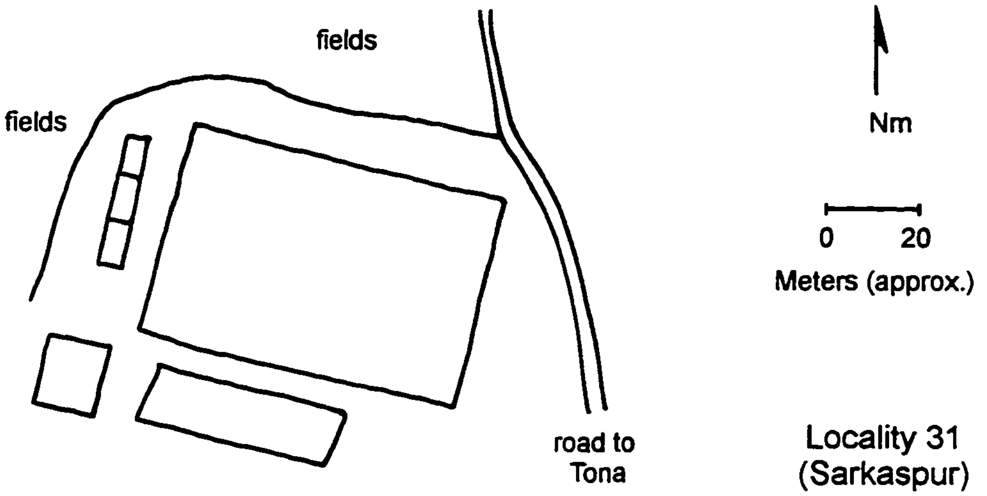

Nm
Bakli nala
0 20
Meters (approx.)
Locality 28
(Rajapur)



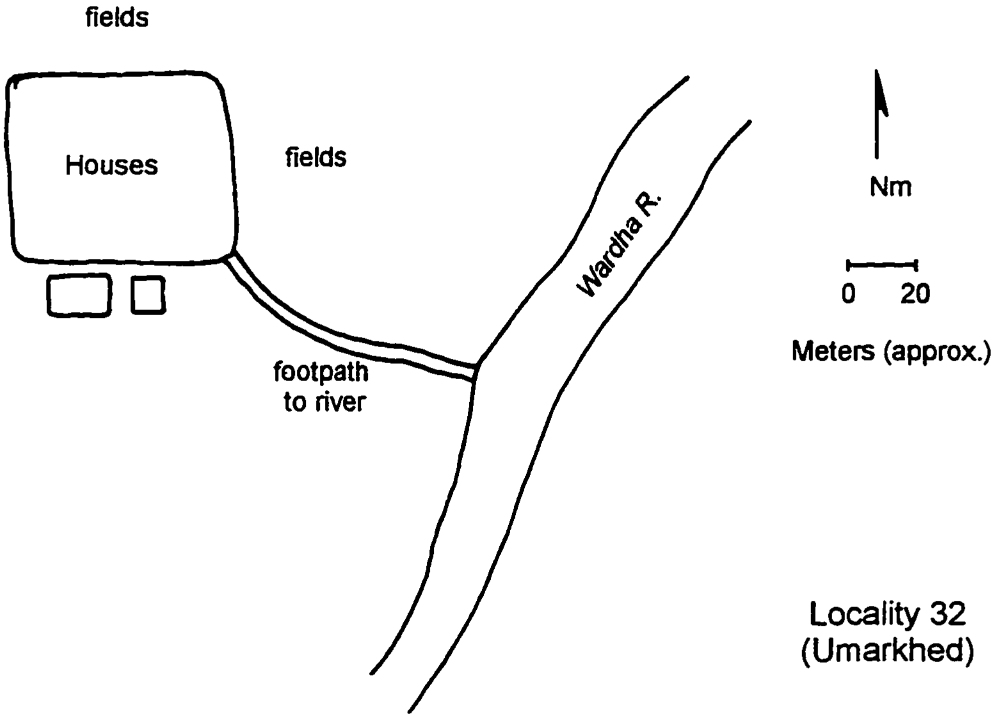

Locality 29
(Vagda)



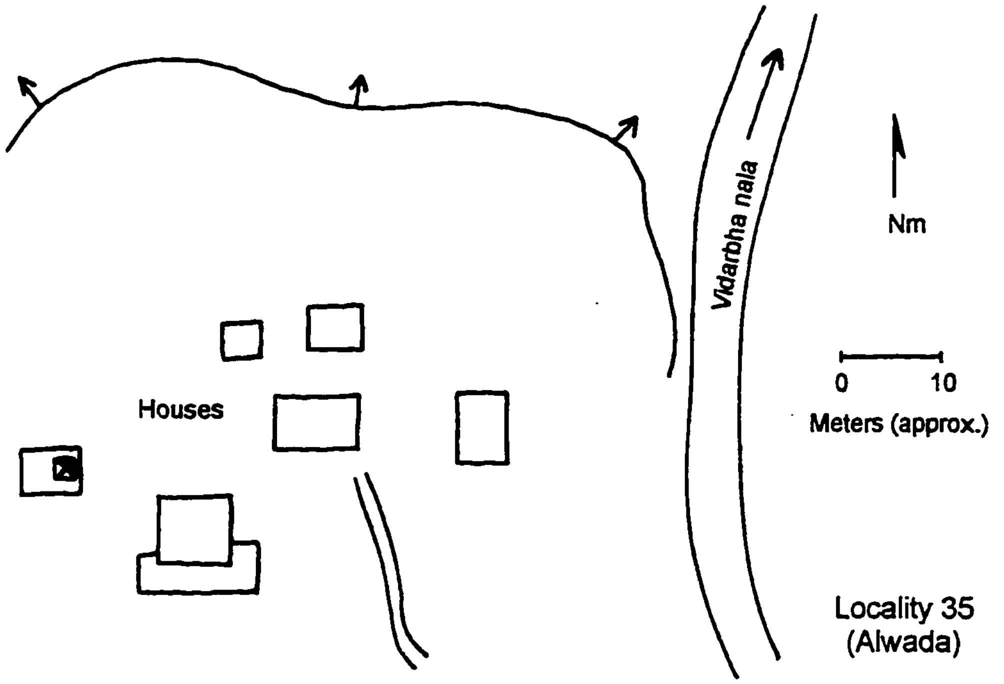

Locality 30
(Ahirwada)

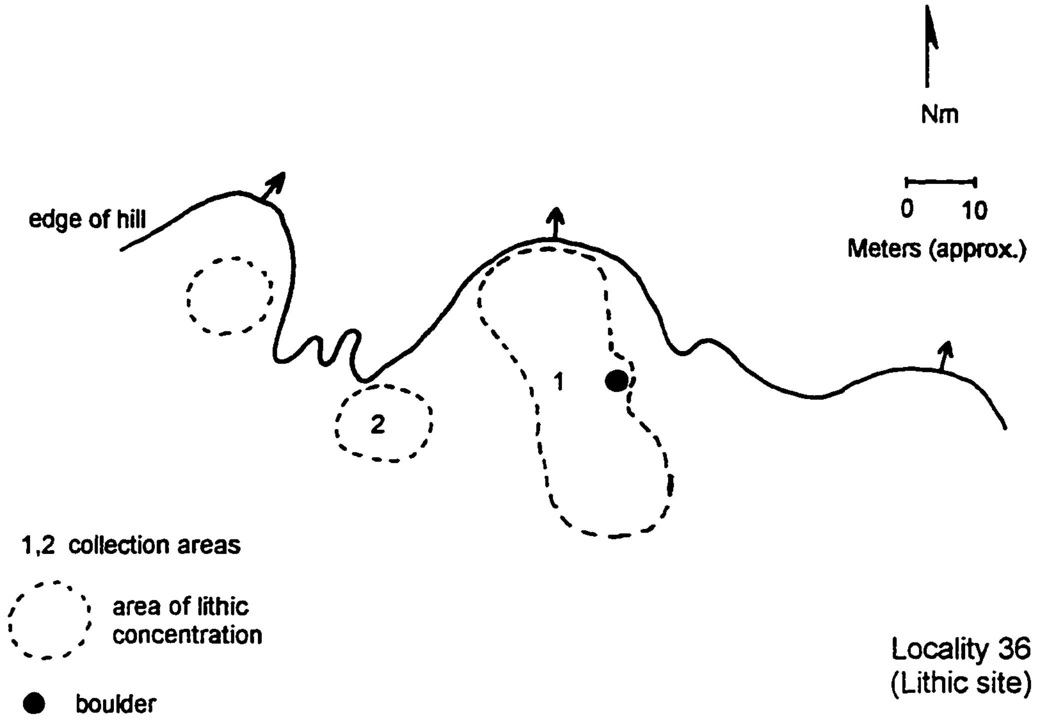


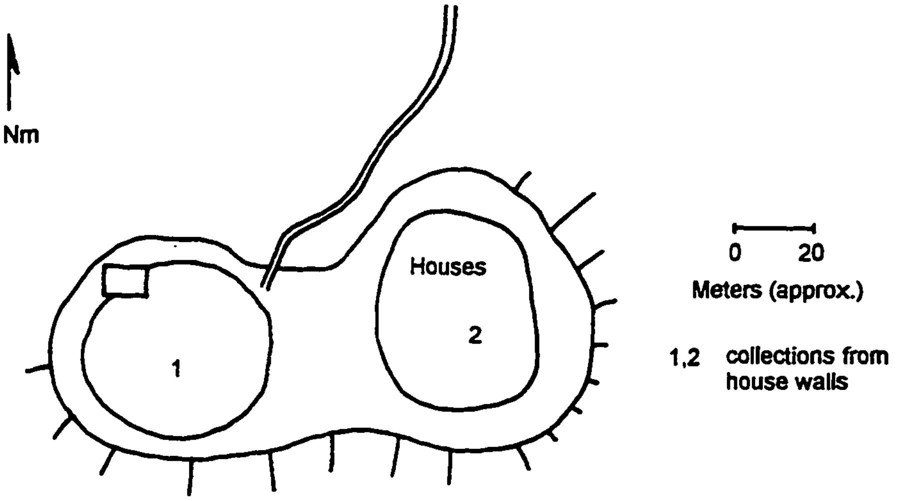

Locality 31
(Sarkaspur)



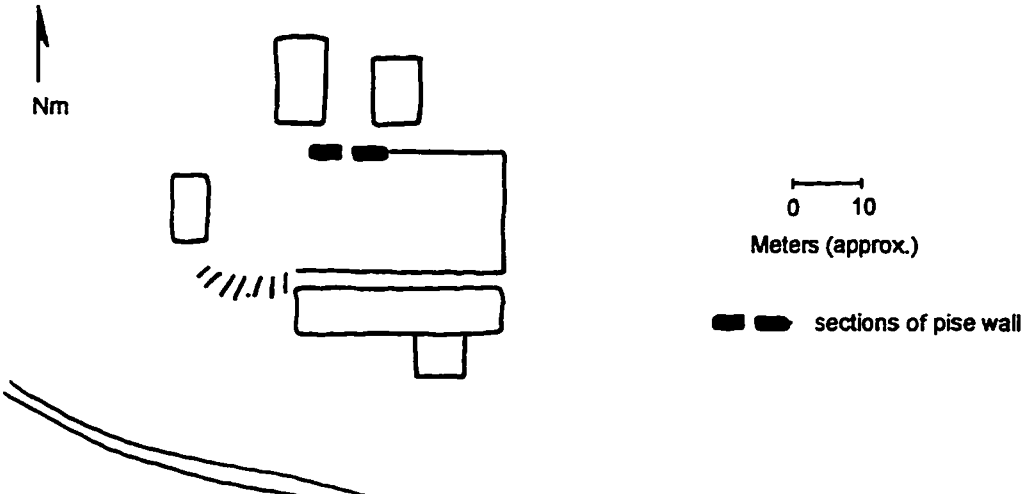

Locality 32
(Umarkhed)


Vidarbha nala
Nm
0 10
Meters (approx.)
Houses
Locality 35
(Alwada)


Nm
0 10
Meters (approx.)
edge of hill
1
2
1,2 collection areas
area of lithic concentration
boulder
Locality 36
(Lithic site)




Locality 37
(Neri)




Locality 40
(Bhambora)

# APPENDIX E

## USES OF WILD FLORA
## IN THE VIDARBHA REGION

| Species name | Other names | Usage | Source |
|---|---|---|---|
| *Acacia arabica* | babul | a special kind of lac grows on it | 6 |
| *Acacia catechu* | khair | | 8 |
| | | Catechu is also "an indispensable ingredient of pan preparations" (p. 29) | 8 |
| | | Catechu used for dyeing cotton, silk and in calico-printing | 8 |
| | | Catechu used in medicine as astringent | 8 |
| | | chief product is catechu, one of the "most important forest-based industries" | 8 |
| | | suitable for raising lac | 8 |
| | | very durable wood, for handles, pestles, harrow-teeth, furniture | 8 |
| | | yields a gum which is a substitute for gum arabic | 8 |
| *Acacia eburnea* | | | 3 |
| | murmatti | pods used for vegetable when young | 1 |
| *Acacia leucophlaea* | hiwar | bark used for tanning | 1 |
| | | "The bark and seeds are ground and mixed with flour in times of scarcity" (p. 34) | 8 |
| | | bark an astringent used medicinally | 8 |
| | | used in tanning leather | 8 |
| | | bark is used as clarifying and flavoring agent | 8 |
| | | bark used in preparing spirits from palm juice and sugar | 8 |
| | | fiber is used for fishing nets and coarse cordage | 8 |
| | | pods eaten by sheep/goats | 8 |
| | | wood used as fuel | 8 |
| | | wood used for agricultural implements, cart wheels | 8 |
| | | yields a gum used in indigenous medicine | 8 |
| | | young pods and seeds are eaten | 8 |
| *Acacia nilotica* | babul, Indian gum arabic | | 8 |
| | | "a deconcoction of the bark is used as a substitute for soap" p. 41 | 8 |
| | | bark is the most important tanning material of N. India | 8 |
| | | used in calico-printing and dyeing | 8 |
| | | as sizing material for silk and cotton | 8 |
| | | ground bark mixed with sesamum indicum has been used for food | 8 |
| | | gum is fried in ghee and used to make sweetmeats | 8 |
| | | large quantities of lac can be supported by babul | 8 |
| | | pods eaten by sheep, goats, cattle | 8 |
| | | seeds "are eaten roasted or raw in times of acute scarcity" | 8 |
| | | unripe pods used for ink | 8 |
| | | used in medicine | 8 |
| | | wood used for cart axles, yokes, pegs, presses, handles | 8 |
| | | wood used for fuel | 8 |

| Species name | Other names | Usage | Source |
|---|---|---|---|
| *Achryanthes aspera* | aghara | seed possess medicinal properties | 1 |
| | | "young leaves eaten as a pot-herb" (p. 56) | 8 |
| | | high valued in medicine | 8 |
| | | seeds nutritious when cooked with milk, and are a potential source of food | 8 |
| | | used for grazing cattle and goats | 8 |
| *Ailanthus excelsa* | maharuk | planted along roadsides | 1 |
| | | a host for Eri silkworms | 8 |
| | | bark used medicinally | 8 |
| | | leaves, twigs suitable fodder for cattle, sheep, goats | 8 |
| | | used as bee pasturage | 8 |
| | | wood suitable for catamarans and small boats | 8 |
| | | yields an inferior quality of gum | 8 |
| *Albizia lebbek* | | | 8 |
| | | bark and seeds used medicinally | 8 |
| | | good substitute for teak (*T. grandis*) and sal (*Shorea robusta*) | 8 |
| | | leaves used as fodder | 8 |
| | | root-bark and root-gum used as dental powder | 8 |
| | | used as green manure | 8 |
| | | used to check soil erosion | 8 |
| | | very good fuel | 8 |
| | siris | lac grows on this; "it is a very good lac but not of much importance" p. 266. | 6 |
| | siris | planted along roadsides | 1 |
| *Andropogon contortus* | kusal, spear grass | fodder when young | 1 |
| | kusal, spear grass | thatch when mature | 1 |
| *Andropogon foveolatus* | | commonly used for fodder | 1 |
| *Andropogon martini* | tikhari, rusa | "yields a valuable oil" | 1 |
| | tikhari, rusa | stems used for thatching | 1 |
| *Andropogon pachyarthrus* | gondali | eaten by cattle before seeds are ripe | 1 |
| *Anogeissus latifolia* | dhaura | timber | 11 |
| | | dried young leaves and twigs used for tanning leather | 8 |
| | | fresh bark yields about twice as much tannin as dried bark | 8 |
| | | gum is fried and eaten as a confectionery | 8 |
| | | gum used for calico printing | 8 |
| | | provides gatty or gattior Indian gum (less adhesive than Indian gum arabic) | 8 |
| *Anogeissus latifolia* | dhaura | timber used for cart-axles, shafts, poles, handles though is difficult to work | 8 |
| | | timber valuable for fuel | 8 |

| Species name | Other names | Usage | Source |
|---|---|---|---|
| *Areca catechu* | supari | "young leaves are eaten as a vegetable, and in salads" (p. 407) | 8 |
| | | labor-intensive process (described) yields areca nuts | 8 |
| | | leaves used for thatch | 8 |
| | | nuts used in medicine | 8 |
| | | tannins resemble Mimosa bark tannins and are used for dying leather, inks, nets | 8 |
| | | used in veterinary medicine | 8 |
| | | wood used for drain-pipes, walking-stickes | 8 |
| *Areca spp.* | | | 8 |
| *Balanites Roxburghii* | hingan | | 1 |
| *Bassia latifolia* | mhowa | flowers an article of food | 2 |
| | | flowers used to distill spirits | 2 |
| | | good timber | 2 |
| | | seeds yield a useful oil | 2 |
| | | planted along roadsides | 1 |
| *Bauhinia racemosa* | apta | | 1 |
| *Bombax malabaricum* | semal, silk cotton tree | "pods furnish silk cotton used for stuffing cushions, etc." | 1 |
| | | "red flowers serve as food in times of hardship | 1 |
| | | roots used medicinally | 1 |
| *Borassus flabelliformis* | palmyra palm | | 11 |
| *Boswellia serrata* | saleh | inferior timber | 11 |
| *Boswellia th.* | salai | yields the resin olibanum | 2 |
| *Boswellia thurifera* | frankincense, salai | | 1 |
| *Buchanania latifolia* | achar | | 11 |
| *Butea frondosa* | dhak, palas tree | ber lac grows on this | 6 |
| | | leaves as cattle fodder | 1 |
| | | leaves as dining plates | 1 |
| | | red flower used for dye for Holi | 1 |
| | | roots used for making rope | 1 |
| *Caesalpine sepiaria* | Mysore thorn | bark useful for tanning | 9 |
| | | host of lac-insect | 9 |
| | | medicine for jaundice, stomach | 9 |
| *Cassia auriculata* | tarwad | "bark is known to possess tanning properties but is not so used in the District" | 1 |
| | | "leaves are eaten as a vegetable in times of scarcity" (p. 336) | 9 |
| *Cassia auriculata* | tarwad | bark dried and used for tanning | 9 |
| | | bark provides fiber for ropes | 9 |
| | | bark, roots and flowers used medicinally | 9 |
| | | used in combination with bath of T. chebula to preserve tanned color | 9 |

| Species name | Other names | Usage | Source |
|---|---|---|---|
| *Cassia tora* | wild senna | | 9 |
| | | "used in the beginnings of the rains as a vegetable" p. 12) | 1 |
| | | leaves and stems eaten as a vegetable | 9 |
| | | not eaten by cattle; takes over grazing land | 1 |
| | | seeds eaten in times of scarcity | 9 |
| | | seeds used to prepare sweets | 9 |
| | | seeds yield dyes | 9 |
| | | unripe fruits cooked and eaten | 9 |
| | | used as a soap | 9 |
| | | used medicinally | 9 |
| *Chenopodium album* | bathua sag, lamb's quarter | eaten as a vegetable when young | 9 |
| | | leaves and juice used medicinally | 9 |
| | | used as fodder | 9 |
| *Cono. lat.* | | wood used for cart axles | 2 |
| *Crotalaria juncea* | sann-hemp | cultivated mainly for fiber | 4 |
| | | for green-manuring wheat, sown at 38 kg/ha. | 7 |
| | | grown to a small extent as a green manure crop | 4 |
| | | one of the most suitable green-manure crops for wheat | 7 |
| | | seed is a valued cattle food | 4 |
| *Crotaria juncea* | flax | | 11 |
| *Cymbopogon martini vel andropogon* | motia, tikhari | used to make rusa oil, "used in preparing itr and other perfumes" p.270 | 1 |
| *Cymbopogon tibeticus* | | useful fodder | 9 |
| *Cynodon dactylon* | hariali, dub | excellent fodder esp. for horses | 1 |
| *Dalbergia latifolia* | shisham | leaves used medicinally for cattle | 1 |
| *Datura fastuosa* | rubbish heaps | leaves used medicinally; leaves poisonous | 1 |
| *Datura Stramonium* | rubbish heaps | leaves used medicinally; leaves poisonous | 1 |
| *Dendrocalamus strictus* | bans | a form of bamboo | 1 |
| *Diospyros tomentosa* | tendu | timber | 11 |
| *Grewia vestita* | dhaman | inferior timber | 11 |
| *Harwickia* | | bark yields good fiber for ropes, etc. | 2 |
| | | good timber | 2 |
| *Hibiscus cannabinus* | Deccani hemp, ambari | fiber crop | 5 |
| | | young leaves and shoots sometimes eaten as a vegetable | 5 |
| *Hibiscus sabdariffa* | Rozelle of Madras | "useful" in medicine | 5 |
| | | calyces and leaves | 5 |
| | | fiber | 5 |
| *Ischaemum laxum* | sahada | fodder when cut at end of rainy season | 1 |

| Species name | Other names | Usage | Source |
|---|---|---|---|
| *Ischaemum laxum* | | useful for thatch when cut in March | 1 |
| *Ischaemum sulcatum* | paonia | valuable fodder | 1 |
| *Iseilema laxum* | katri | commonly used for fodder | 1 |
| *Lagerstroemia parviflora* | lendia | timber | 11 |
| *Melia Azadirachta* | nim | described as "one of the usual fruit-bearing and sacred trees" | 3 |
| *Melia azadirachta* | nim, bagain | planted along roadsides | 1 |
| *Melia indica* | nim | planted along roadsides | 1 |
| *Moringa pterygosperma* | shenga, sojna | pods used as a vegetable | 1 |
| *Nephelium litchi* | litchi | lac grows on this; "it is a very good lac but not of much importance" p. 266. | 6 |
| *Odina wodier* | moyen | inferior timber | 11 |
| *Oryza officinalis Wall.* | wild rice | eaten by Hindus on fast days; eaten by poor | 10 |
| *Oryza officinalis Wall.* | wild rice | occurs as a significant weed in cultivated rice | 10 |
| *Oryza sativa var. fatua* | wild rice | eaten by Hindus on fast days; eaten by poor | 10 |
| | | occurs as a significant weed in cultivated rice | 10 |
| *Ougeinia dalbergioides* | tiwas | | 1 |
| *Phoenix sylvestris* | bastard date-palm | favorite lair of wild hog | 3 |
| *Prosopis spicigera* | saondar | pods used for vegetable when young | 1 |
| *Pterocarpus Marsupium* | bijasal, bija | cart poles | 1 |
| *Pterocarpus Marsupium* | bijasal, bija | musical instruments | 1 |
| *Sapindus Mukorossi* | rithia, soapnut | | 1 |
| *Schleichera trijuga* | kusum tree | gives two harvests of kusum-lac, in January and July | 6 |
| *Schrebera swietenioides* | mokha | | 11 |
| *Silkia marvel* | | commonly used for fodder | 1 |
| *Sorghum halepense* | boru, elephant grass | | 1 |
| *Soymida febrifuga* | rohan | | 11 |
| *Tamarix indica* | jhau | | 1 |
| *Tectona grandis* | teak | preferred tree of charcoal-burners | 2 |
| *Tectona grandis* | teak | timber | 11 |
| *Tectonia grandis* | teak | | 1 |
| *Terminalia tomentosa* | sal | timber | 11 |
| *Woodfordia floribunda* | dhewti | | 1 |
| *Zizyphus jujuba* | ber tree | gives two harvests of ber-lac, in May and Oct. | 6 |
| *Zizyphus jujuba Linn.* | | | 1 |
| *Zizyphus vulgaris* | ber, wild plum | stems made into spindles | 1 |
| *Zizyphus vulgaris* | ber, wild plum | thorns used for fencing | 1 |
| *Zizyphus xylopyra* | ghatbor | | 11 |

Key to sources:

1 Fitzgerald and Nelson 1983[1911]
2 Grant 1984[1870]
3 His Majesty's Secretary of State 1908
4 Howard and Howard 1910
5 Howard and Howard 1911-12
6 Maxwell-Lefroy 1909
7 Publications and Information Directorate 1976
8 Publications and Information Directorate 1985
9 Publications and Information Directorate 1992
10 Roy 1921
11 Russell 1906

## BIBLIOGRAPHY


Adams, Robert McC.
1981 Heartland of Cities: Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates. University of Chicago, Chicago.
1965 Land Behind Baghdad: A History of Settlement on the Diyala Plain. University of Chicago, Chicago.

Adams, William Y. and Ernest W. Adams
1991 Archaeological Typology and Practical Reality. Cambridge University Press, Cambridge.

Agricultural Ledger Series
1895 Names of Field Crops Grown in the Central Provinces. Anjuman-i-Islamia press, Jubbulpore.

Alcock, Susan E.
1991 Urban Survey and the Polis of Phlius. Hesperia 60: 421-463.

Aldenderfer, Mark S.
1987 On the Structure of Archaeological Data. In Quantitative Research in Archaeology, edited by Mark S. Aldenderfer, pp. 89-113. Sage Publications, Newbury Park, California.

Alexander, Jennifer and Paul Alexander
1991 Protecting Peasants from Capitalism: The Subordination of Javanese Traders by the Colonial State. Comparative studies in society and history, 33(2):370-394.

Algaze, Guillermo
1993 The Uruk World System: The Dynamics of Expansion of Early Mesopotamian Civilization. University of Chicago, Chicago.

Allchin, F.R.
1995 The Archaeology of Early Historic South Asia. Cambridge University Press, Cambridge.
1961 Utnur Excavations. Andhra Pradesh Archaeological Series No. 5, Hyderabad.

Allen, Kathleen M.S.
1992 Iroquois Ceramic Production: A Case Study of Household-level Organization. In Ceramic Production and Distribution: an Integrated Approach, edited by George J. Bey III and

Christopher A. Pool, pp. 133-154. Westview Press, Boulder, Colorado.

Altekar, A.S.
1982[1960]a The History of the Vakatakas. In The Early History of the Deccan, edited by G. Yazdani, pp. 151-200. Oriental Books, New Delhi.
1982[1960]b The History of the Rashtrakutas. In The Early History of the Deccan, edited by G. Yazdani, pp. 249-314. Oriental Books, New Delhi.

Ammerman, Albert J.
1985 Plow-zone Experiments in Calabria, Italy. Journal of Field Archaeology 12(1): 33-40.

Ansari, Zainduddin Dawood and Madhukar Shripad Mate
1966 Excavations at Dwarka. Deccan College Building Centernary and silver Jubilee Series 44, Deccan College Postgraduate and Research Institute, Poona.

Appadurai, Arjun, ed.
1986 The Social Life of Things. Cambridge University Press, Cambridge.

Ardika, I.W., P.S. Bellwood, R.A. Eggleton and D.J. Ellis
1993 A Single Source for South Asian Export-quality Rouletted Ware? Man and Environment 18:101-109.

Armstrong, W.E.
1924 Rossel Island Money: a Unique Monetary System. The Economic Journal 34:423-429. Reprinted in Tribal and Peasant Economies, edited by George Dalton, 1967, pp. 246-253. Natural History Press, Garden City N.Y.

Arnold, Dean E. and Alvaro L. Nieves
1992 Factors Affecting Ceramic Production. In Ceramic Production and Distribution: An Integrated Approach, edited by George J. Bey III and Christopher A. Pool, pp. 93-113. Westview Press, Boulder, Colorado.

Arunachalam, B.
1985 Panorama. In Maharashtra, edited by Saryu Doshi, pp. 15-22. Marg Publications, Bombay.

Awasthi, D.P.
1980-81 The Famine of 1896-98 in the Central Provinces. Journal of the Madhya Pradesh Itihasa Parishad 12:81-84.

Babu, J. Krishna Prasad
1993 Social and Economic Transition: 4th-7th century AD. In Social and Economic History of Early Deccan, edited by Aloka Parasher-Sen, pp. 115-157. Manohar, New Delhi.

Bajpai, K.D.
1978 Some Place-Names of the Sanchi Inscriptions. Prachya Pratibha (Birla Institute of Art and Music, Bhopal) 6(1):15-19.
1967 New Light on the Sakas of Malwa. Bulletin of ancient Indian History and Archaeology (University of Saugar, India) I:7-11.

Banerjee, N.R.
1986 Nagda 1955-57. Memoirs of the Archaeological Survey of India, New Delhi.

Barber, C.A.
1907 Sugarcane Cultivation in the Irrigated Lands of the Godavari Delta. The Agricultural Journal of India 2:33-41.

Barnes, Gina
1995 An Introduction to Buddhist Archaeology. World Archaeology 27(2): 165-182.

Begley, Vimala
1994 Are There Imported Fine Wares at Alagankulam, South India? In From Sumer to Meluhha: Contributions to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., edited by Jonathan Mark Kenoyer, pp. 315-321. Wisconsin Archaeological Reports 3. Prehistory Press, Madison, WI.
1991 Ceramic Evidence for Pre-Periplus Trade on the Indian Coasts. In Rome and India, edited by Vimala Begley and Richard Daniel de Puma, pp. 157-196. University of Wisconsin, Madision, WI.
1983 Arikamedu Reconsidered. American Journal of Archaeology 87:461-481.

Begley, Vimala and Richard Daniel De Puma, editors
1991 Rome and India: The Ancient Sea Trade. University of Wisconsin Press, Madison.

Bennett, W.J. Jr., and Jeffrey A. Blakely
1989 Morphology, Composition and Stratigraphy: A Data Base Concept for Ceramic Study and Publication. In Analysis and Publication of Ceramics: The Computer Data-base in Archaeology, edited by Jeffrey A. Blakely and W.J. Bennett, Jr., pp. 1-18. BAR International Series 551, Oxford.

Berdan, Frances
1989 Trade and Markets in Precapitalist States. In Economic Anthropology, edited by Stuart Plattner, pp. 78-107. Stanford University Press, Stanford.

Berghaus, Peter
1991 Roman Coins from India and their Imitations. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 108-121. Indian Institute of Research in Numismatic Studies, Nasik.

Bintliff, John and Anthony Snodgrass
1991 The Roman Countryside in Central Greece: Observations and Theories from the Boeotia Survey. In Roman Landscapes: Archaeological Survey in the Mediterranean Region, edited by G. Barker and J. Lloyd, pp. 122-32. British School at Rome, London.
1988 Mediterranean Survey and the City. Antiquity 62:57-71.

Blanton, Richard E.
1978 Monte Alban: Settlement Patterns at the Ancient Zapotec Capital. Academic Press, New York.

Bohannan, Paul
1959 The Impact of Money on an African Subsistence Economy. Journal of Economic History 19(4): 491-503. Reprinted in Tribal and Peasant Economies, edited by George Dalton, 1967, pp. 123-135. Natural History Press, Garden City N.Y.

Bower, John
1986 A Survey of Surveys: Aspects of Surface Archaeology in Sub-Saharan Africa. The African Archaeological Review 4:21-40.

Braudel, Fernand
1992[1979] The Wheels of Commerce. Translated by Siân Reynolds. University of California Press, Berkeley.
1975 Capitalism and Material Life 1400-1800. Translated by Miriam Kochan. Harper Colophon, New York.

Braun, David P.
1979 Illinois Hopewell Burial Ppractices and Social Organization: A Reexamination of the Klunk-Gibson Mound Group. In Hopewell Archaeology: The Chillicothe Conference, edited by David S. Brose and N'omi Greber, pp. 66-79. Kent State University Press, Ohio.

Brown, James A.
1982 On the Structure of Artifact Typologies. In Essays on Archaeological Typology, edited by Robert Whallon and James A. Brown, pp. 176-189. Center for American Archeology Press, Evanston, Illinois.

Brumfiel, E.
1987 Elite and Utilitarian Crafts in the Aztec State. In Specialization, Exchange and Complex Societies, edited by E. Brumfiel and T. Earle, pp. 102-118. Cambridge University Press, Cambridge.

Brumfiel, Elizabeth M. and Timothy K. Earle
1987 Specialization, Exchange and Complex Societies: An Introduction. In Specialization, Exchange and Complex Societies, edited by Elizabeth M. Brumfiel and Timothy K. Earle, pp. 1-9. Cambridge University Press, Cambridge.

Butler, E.J.
1910 The Wilt Disease of Pigeon-Pea. Memoirs of the Department of Agriculture in India, Botanical Series 2(9):1-64.

Carey, L.S.
1898 Note on the Outturn of Land under the Principal Crops Grown in the Central Provinces. Secretariat Press, Nagpur.

Carswell, John
1990 The Excavation of Mantai. Ancient Ceylon 7:17-28.

Cary, M. and H.H. Scullard
1975 A History of Rome down to the reign of Constantine, third edition. Macmillan, London.

Casal, J.M.
1949 Fouilles de Virampatnam-Arikamedu. Imprimerie National, Paris.

Casson, Lionel, ed.
1989 The Periplus Maris Erythraei. Princeton University Press, Princeton.

Chakrabarti, Dilip K.
1994 Archaeology of the Chhotanagpur Plateau and the Bengal Basin. In From Sumer to Meluhha: Contributions to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., edited by Jonathan Mark Kenoyer, pp. 253-259.

Wisconsin Archaeological Reports 3. Prehistory Press, Madison, WI.

Census of India 1881
1882 Central Provinces. Education Society Press, Byculla (Bombay).

Central Provinces District Gazetteers
1913 Amraoti District B Volume Statistical Tables (1891-1911). Indian Press, Allahabad.

Central Provinces District Gazetteers
1916 Wardha District B Volume Statstical Tables (1891-1914). British India Press.

Chelliah, J.V.
1985 Pattupattu: The Tamil Idylls. Tamil University, Thanjavur.

Chenna Reddy, P.
1991 Guilds in Medieval Andhra Desa (A.D. 1000-1500). Sundeep Prakashan, Delhi.

Cherry, John F.
1983 Frogs Around the Pond: Perspectives on Current Archaeological Survey in the Mediterranean Region. In Archaeological Survey in the Mediterranean Area, edited by D.R.Keller and D.W. Rupp, pp. 375-416. BAR International Series 155, Oxford.

Cherry, J.F., J. Davis and E. Mantzourani
1991 Landscape Archaeology as Long-Term History. Monumenta Archaeologica Series No. 16, UCLA Archaeological Publications, UCLA, Los Angeles.

Claassen, Cheryl and Samuella Sigmann
1993 Sourcing Busycon Artifacts of the Eastern United States. American Antiquity 58(2):333-347.

Colebrooke, H.T.
1790 Narrative of a Journey to Nagpúr. Mss. National Archives, New Delhi.

Conkey, Margaret
1978 Style and Information in Cultural Evolution: Toward a Predictive Model for the Paleolithic. In Social Archaeology, edited by Charles L. Redman, Mary Jane Berman, Edward V. Curtin, William T. Langhorne, Jr., Nina M. Versaggi and Jeffrey C. Wanser, pp. 61-85. Academic Press, New York.

Curtin, Philip D.
1984 Cross-cultural Trade in World History. Cambridge University Press, Cambridge.

Dalton, George
1975 Karl Polanyi's Analysis of Long-Distance Trade and his Wider Paradigm. In Ancient Civilization and Trade, edited by Jeremy Sabloff and C.C. Lamberg-Karlovsky, pp. 63-132.

Dannhaeuser, Norbert
1989 Marketing in Developing Urban Areas. In Economic Anthropology, edited by Stuart Plattner, pp. 222-252. Stanford University Press, Stanford.

Deglurkar, G.B. and Gouri P. Lad
1992 Megalithic Raipur (1985-1990). Deccan College and Post-Graduate Institute, Pune.

Dehejia, Vidya
1992 The Collective and Popular Basis of Early Buddhist Patronage: Sacred Monuments, 100 BC - AD 250. In The Powers of Art: Patronage in Indian Culture, edited by Barbara Stoler Miller, pp. 35-45. Oxford University Press, Delhi.

Deloche, Jean
1980 La Circulation en Inde avant la Révolution des Transports: Tome I: La Voie de Terre. Ecole Française d'Extrême Orient, Paris.

Deo, Shantaram Bhalchandra
1985 The Personality of Vidarbha Megaliths. In Studies in Indian Archaeology, H.D. Sankalia Felicitation Volume, edited by S.B. Deo and M.K. Dhavalikar, pp. 23-31. Popular Prakashan, Bombay.
1972 Mahurjhari Excavation (1970-72). Nagpur University Press, Nagpur.
1970 Excavations at Takalghat and Khapa (1968-69). Nagpur University, Nagpur.

Deo, Shantaram Bhalchandra and Madhukar Keshav Dhavalikar
1968 Paunar Excavation 1967. Nagpur University, Nagpur.

Deo, Shantaram Bhalchandra and Ramesh Shankar Gupte
1974 Excavations at Bhokardan 1973. Nagpur University Press, Nagpur.

Deo, Shantaram Bhalchandra and Jagat Pati Joshi
1972 Pauni Excavation (1969-70). Nagpur University Press, Nagpur.

Deyell, John S.
1991 Numismatic Methodologies Answer Questions Economists Might Ask. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 1-15. Indian Institute of Research in Numismatic Studies, Nasik.

Dhavalikar, M.K.
1985 Antiquity. In Maharashtra, edited by Saryu Doshi, pp. 23-30. Marg Publications, Bombay.

Dhavalikar, M.K. and Gregory L. Possehl
1974 Subsistence Pattern of an Early Farming Community of Western India. Puratattva 7: 39-46.

Dhavalikar, M.K., H.D. Sankalia and Z.D. Ansari
1988 Excavations at Inamgaon. Deccan College Post-Graduate Research Institute, Pune.

Dikshit, K.R.
1986 Maharashtra in Maps. Maharashtra Board for Literature and Culture, Bombay.

Dikshit, Moreshwar G.
1968 Excavations at Kaundinyapura. Director of Archives and Archaeology, Bombay.
1955 Tripuri 1952. Government of Madhya Pradesh.

Director of Archives and Historical Monuments
1962-63 Annual Report of the Department of Archaeology Government of Maharashtra. Director, Government Printing and Stationery, Bombay.

Dirks, Nicholas B.
1976 Political Authority and Structural Change in Early South Indian History. Indian Economic and Social History Review, 13:2, pp. 125-157.

Douglas, Mary and Baron Isherwood
1979 The World of Goods. Basic Books, New York.

Dunnell, Robert C.
1986 Methodological Issues in Americanist Artifact classification. Advances in Archaeological Method and Theory, vol. 9, edited by Michael B. Schiffer, pp. 149-207. Academic Press, Orlando.

Durante, Silvio
1979 The Utilization of Xancus pyrum (L.) at Sharh-i-Sokhta. In South Asian Archaeology 1975, edited by J.E. Van Lohuizen-de Leeuw, pp. 27-42. E.J. Brill, Leiden.

During-Caspers, E.C.L.
1981 The Indian Ivory Figurine from Pompei - A Reconsideration of its Functional Use. In South Asian Archaeology 1979, edited by Herbert Hartel, pp. 341-353. Dietrich Reimer Verlag, Berlin.

Earle, Timothy K.
1990 Style and iconography as legitimation in complex chiefdoms. In The Uses of Style in Archaeology, edited by Margaret W. Conkey and Christine A. Hastorf, pp. 73-81. Cambridge University Press, Cambridge.

Earle, Timothy K. and Terence N. D'Altroy
1982 Storage Facilities and State Finance in the Upper Mantaro Valley, Peru. In Contexts for Prehistoric Exchange, edited by Jonathan E. Ericson and Timothy K. Earle, pp. 265-290. Academic Press, N.Y.

Ebert, James I.
1992 Distributional Archaeology. University of New Mexico Press, Albuquerque.

Ellen, Roy
1979 Introductory Essay. In Classifications in their Social Context, edited by Roy F. Ellen and David Reason, pp. 1-32. Academic Press, London.

Erdosy, George
1988 Urbanisation in Early Historic India. British Archaeological Reports International series 430.

Fairservis, Walter A.
1967 The Origin Character and Decline of an Early Civilization, American Museum Novitates no. 2302. American Museum of Natural History, New York.

Feld, Scott L.
1981 The Focused Organization of Social Ties. American Journal of Sociology 86(5): 1015-1035.

Femia, Joseph
1975 Hegemony and Consciousness in the Thought of Antonio Gramsci. Political Studies 23(1): 29-48.

Fine, Ben and Ellen Leopold
1993 The World of Consumption. Routledge, London.
1990 Consumerism and the Industrial Revolution. Social History 15(2):151-179.

Finlay, Robert
1992 Portuguese and Chinese Maritime Imperialism: Camoes's Lusiads and Luo Maodeng's Voyage of the San Bao Eunuch. Comparative Studies in Society and History 34(2):225-241.

Finley, M.I.
1979[1973] The Ancient Economy. Book Club Associates, London.
1954 Wealth and Labor [Archaic Greece]. Originally printed as a portion of Chapter III in The World of Odysseus, pp. 46-73. Reprinted in Tribal and Peasant Economies, edited by George Dalton, 1967, pp. 397-417. Natural History Press, Garden City N.Y.

Fish, Suzanne K. and Stephen A. Kowalewski, editors
1990 The Archaeology of Regions. Smithsonian Institution Press, Washington DC.

Fitzgerald, S.V. and A.E. Nelson
1983 [1911] Central Provinces District Gazetteers Amraoti District. Government Photozinco Press, Pune.

Frank, Andre Gunder
1992 The Centrality of Central Asia. Studies in History new series 8(1):43-97.

Fried, Morton
1967 The Evolution of Political Society. Random House, N.Y.

Friedman, Jonathan
1990 The Political Economy of Elegance. Culture and History 7: 101-125.

Frykenberg, Robert E.
1979a Traditional Processes of Power in South India. In Land Control and Social Structure in Indian History, edited by Robert Frykenberg. New Delhi: Manohan, pp. 217-236.
1979b Village Strength in South India. In Land Control and Social Structure in Indian History, edited by Robert Frykenberg. New Delhi: Manohan, pp. 247-267.

Fussman, Gerard
1988 Central and Provincial Administration in Ancient India: the Problem of the Mauryan Empire. The Indian Historical Review 14 (1-2):43-72.

Gaffney, Vince and Martin Tingle
1985 The Maddle Farm (Berks.) Project and Micro-Regional Analysis. In Archaeological Field Survey in Britain and Abroad, edited by Sarah Macready and F.G. Thompson, Society of Antiquaries occasional paper (new series VI), London, pp. 67-73.

Garde, M.B
1940 Annual Administrative Report of the Archaeological Department of Gwalior State for 1938-39. Gwalior.

Gardin, Jean-Claude
1980 Archaeological Constructs. Cambridge University Press, Cambridge.

Garnsey, Peter, Keith Hopkins and C.R. Whittaker, editors
1983 Trade in the Ancient Economy. University of California Press, Berkeley.

Geological Survey of India
1988-89 Geological Map of India. Geological Survey of India, Calcutta.
1974 Geology and Mineral Resources of the States of India. Part II: Maharashtra. Geological Survey of India Miscellaneous publication No. 30, Calcutta.

Ghosh, A.
1990 An Encyclopedia of Indian Archaeology, vols. 1 and 2. E.J. Brill, Leiden.

Ghosh, N.C
1986 Excavations at Satanikota 1977-80. Memoirs of the Archaeological Survey of India No. 82. Archaeological Survey of India.

Gledhill, J. and M. Larsen
1982 The Polanyi Paradigm and a Dynamic Analysis of Archaic States. In Theory and Explanation in Archaeology, edited by C. Renfrew, M. Rowlands and B. Seagraves, pp. 197-229. Academic Press, New York.

Gokhale, Shobhana
1991a A Unique Coin of Isamahisa. Numismatic Digest 15:31-40.
1991b Junnar in Trade during Satavahana Period. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 55-57. Indian Institute of Research in Numismatic Studies, Nasik.

Gordon, Stewart N.
1993 The Marathas. Cambridge University Press, Cambridge.
1969 Scarf and Sword: Thugs, Marauders and State-Formation in 18th century Malwa. Indian Economic and Social History Review 6(4):403-429.

Gottdiener, M.
1995 Postmodern Semiotics: Material Culture and the Forms of Postmodern Life. Blackwell, Oxford.

Graham, R.J.D.
1913-14 Preliminary Note on the Classification of Rice in the Central Provinces. Memoirs of the Department of Agriculture in India (Botanical Series) 6:209-229.

Granovetter, Mark
1985 Economic Action and Social Structure: The Problem of Embeddedness. American Journal of Sociology 91(3):481-510.

Grant, Charles
1984[1870] The Gazetteer of the Central Provinces of India, second edition. Usha Jain, New Delhi.

Grant, M.
1958 Roman History from Coins. Cambridge University Press, Cambridge.

Gregory, C.A.
1982 Gifts and Commodities. Academic Press, London.

Gros, Francois
1968 Le Paripatal: Texte Tamoul. Institute Francais d'Indologie, Pondicherry.

Gupta, P.L.
1991 Coins in Rome's India Trade. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 99-107. Indian Institute of Research in Numismatic Studies, Nasik.

Gupta, Paresh Chandra Das
1960 Graeco-Roman Finds from Bengal. The Indo-Asian Culture 8(4): 386-392.

Gurumurthy, S.
1981 Ceramic Traditions in South India (Down to 300 A.D.). University of Madras, Madras.

Habib, Irfan
1995[1987] Caste in India History. Originally published in Caste and Money in Indian History, Bombay; reprinted in Essays in Indian History: Towards a Marxist Perspective, pp. 161-179. Tulika, New Delhi.

Hall, Kenneth R.
1991 Coinage, Trade, and Economy in Early South India and Southeast Asia. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 99-107. Indian Institute of Research in Numismatic Studies, Nasik.
1985 Maritime Trade and State Development in Early Southeast Asia. University of Hawaii Press, Honolulu.
1980 Trade and Statecraft in the Age of the Colas. New Delhi: Abhinav Publications.

Hamilton, Gary G.
1977 Chinese Consumption of Foreign Commodities: A Comparative Perspective. American Sociological Review 47:877-891.

Hamilton, Gary G. and Chi-Kong Lai
1989 Consumerism without Capitalism: Consumption and Brand Names in Late Imperial China. In The Social Economy of Consumption, edited by Henry J. Rutz and Benjamin S. Orlove, pp. 253-279. University Press of America, Lanham, MA.

Hamilton, Walter
1993[1828] The East India Gazetteer, second edition. Facsimile copy, Low Price Publications, Delhi.

Hassig, Ross
1985 Trade, Tribute and Transportation. University of Oklahoma Press, Norman.

Heitzman, James
1987 State Formation in South India 850-1280. Indian Economic and Social History Review, 24:1, pp. 35-61.

Helms, Mary W.
1979 Ancient Panama: Chiefs in Search of Power. University of Texas Press, Austin.

Hill, James N.
1970 Prehistoric Social Organization in the American Southwest: Theory and Method. In Reconstructing

Prehistoric Pueblo Societies, edited by William Longacre, pp. 11-58. University of New Mexico Press, Albuquerque.

Hill, James N., and Robert K. Evans
1972 A Model for Classification and Typology. In Models in Archaeology, edited by D. Clarke, pp. 231-273. Methuen, London.

His Majesty's Secretary of State
1908 The Imperial Gazetteer of India, volume 5. Oxford, Clarendon Press.

Hole, Frank
1983 Changing Directions in Archaeological Thought. In Ancient North Americans, edited by Jesse Jennings, pp. 1-23. W.H. Freeman, San Francisco.

Hopkins, K.
1983 Grain for Rome. In Trade in the Ancient Economy, edited by Peter Garnsey, Keith Hopkins and C.R. Whittaker, pp. 118-130. Chatto and Windus, London.

Hopkins, Terence K.
1957 Sociology and the Substantive View of the Economy. In Trade and Market in the Early Empires, edited by K. Polanyi, C.M. Arensberg, and H.W. Pearson, pp. 271-306. Free Press, New York.

Hornell, James
1914 The Sacred Chank of India. Madras Fisheries Bulletin No. 7, Madras.

Howard, Albert
1924 Crop Production in India. Oxford University Press, Humphrey Milford.

Howard, Albert and Gabrielle L.C. Howard
1915 Studies in Indian Oil Seeds. Memoirs of the Department of Agriculture in India (Botanical Series) 7(7):237-272.
1911-12 On Some New Varieties of Hibiscus Cannabinus. Memoirs of the Department of Agriculture in India (Botanical Series) 4:9-36.
1910 On Two Varieties of Sann, *Crotalaria juncea*, L. Memoirs of the Department of Agriculture in India (Botanical Series) 3(2):177-189.

Howard, Gabrielle L.C. and K.S. Abdur Rahman Khan
1928a Studies in Indian Oil Seeds 2. Memoirs of the Department of Agriculture in India (Botanical Series) 12(4):135-183.
1928b The Indian Types of *Lathyrus sativus* L. Memoirs of the Department of Agriculture in India (Botanical Series) 15:51-77.

Howgego, Christoper
1990 Why did Ancient States Strike Coins? Numismatic Chronicle 150:1-25.
1992 The Supply and Use of Money in the Roman World 200 BC to AD 300. Journal of Roman Studies 82:1-31.

Indian Archaeology, A Review (Archaeological Survey of India)

Jain, Jyoti Prasad
1964 The Jaina Sources of the History of Ancient India (100 BC to AD 900). Munshi Ram Manohar Lal, Delhi.

Jha, A.K.
1991 Introductory Address. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 99-107. Indian Institute of Research in Numismatic Studies, Nasik.

Jha, Vivekanand
1988 Ancient Indian Political History: Possibilities and Pitfalls. The Indian Historical Review 14 (1&2): 90-110.

Johnson, Gregory A
1975 Locational Analysis and the Investigation of Uruk Local Exchange Systems. In Ancient Civilization and Trade, edited by Jeremy A. Sabloff and C.C. Lamberg-Karlovsky, pp. 285-339. University of New Mexico Press, Albuquerque.

Kajale, M.D.
1974 Ancient Grains from India. Bulletin of the Deccan College Research Institute 34 (1-4):55-74.
1976-77 Ancient Plant Economy at Nevasa in the Satavahana and Indo Roman Periods. Bulletin of the Deccan College Postgraduate and Research Institute 36:50-61.
1988 Ancient Plant Economy at Chalcolithic Tuljapur Garhi, District Amraoti, Maharasthra. Current Science (Bangalore) 57(5):377-379.
1989 Archaeobotanical Investigation on Megalithic Bhagimohari. Man and Environment 13:87-100.

Kamalapur, J.N.
1961 The Deccan Forts: A Study in the Art of Fortification in Mediaeval India. Popular Book Depot, Bombay.

Kangle, R.P.
1960 The Kautilya Arthasastra. University of Bombay, Bombay.

Karve, I.
1968 Maharashtra: Land and its People. Maharashtra State Gazeteers, Government of Maharashtra.

Keay, S., J. Crieghton and D. Jordan
1991 Sampling Ancient Towns. Oxford Journal of Archaeology 10(3):371-383.

Keay, S.J. and M. Millett
1991 Surface Survey and Site Recognition in Spain: The Ager Terraconensis Survey and its Background. In Interpreting Artifact Scatters: Contributions to Plowzone Archaeology, edited by A.J. Schofield, pp. 129-139. Oxford University Press, Oxford.

Kenoyer, J. Mark
1984 Shell Working Industries of the Indus Civilization: A Summary. Paléorient 10(1):49-63
1983 Shell Working Industries of the Indus Civilization: An Archaeological and Ethnographic Perspective. University Microfilms, Ann Arbor.

Khan, S. Ahmad
1990 Consumer Spatial Behavior in a Backward Economy. The Deccan Geographer 28:645-655.

Kitts, Eustace J.
1882 Census of Berar 1881. Education Society's Press, Byculla (Bombay).

Krader, Laurence
1992 The Centrality of Central Asia: A Dialogue with Frank. Studies in History new series 8(1):113-118.

Kvamme, Kenneth L. and Timothy A. Kohler
1988 Geographic Information Systems: Technical Aids for Data Collection, Analysis and Display. In Quantifying the Present and Predicting the Past, edited by W. James Judge and Lynne Sebastian, pp. 493-547. U.S.

Department of the Interior, Bureau of Land Management Service Center, Denver, Colorado.

Lahiri, A.N.
1991 The Revolution Brought About by Silver Punchmarked Coins in the Sphere of Trade Transactions. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 16-22. Indian Institute of Research in Numismatic Studies, Nasik.

Lahiri, Bela
1991 Tribal and Local Coins in Relation to Trade Transactions. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 28-32. Indian Institute of Research in Numismatic Studies, Nasik.

Lal, B.B.
1955 Excavations at Hastinapura and Other Explorations in the Upper Ganga and Sutlej Basins 1950-52. Ancient India 10 & 11:5-151.
1949 Sisulpagarh 1948: An Early Historic Fort in Eastern India. Ancient India 5:62-105.

Lal, Makkhan
1984 Settlement History and Rise of Civilization in Ganga-Yamuna Doab. B.R. Publishing House, Delhi.

Lamberg-Karlovsky, C.C.
1989 Mesopotamia, Central Asia and the Indus valley: so the Kings were Killed. In Archaeological Thought in America, edited by C.C. Lamberg-Karlovsky, pp. 241-267.

LeCount, Lisa
1992 Highland Peruvian Cuisine. Paper presented at the American Anthropological Association meetings, Chicago.

Leone, Mark P. and Parker B. Potter, Jr., eds.
1988 The Recovery of Meaning: Historical Archaeology in the United States. Smithsonian Press, Washington D.C.

Lewis, Napthali
1983 Life in Egypt Under Roman Rule. Clarendon Press, Oxford.

Liu, Xinru
1988 Ancient India and Ancient China: Trade and Regional Exchanges AD 1-600. Oxford University Press, Delhi.

Lloyd, William
1808a Survey of a Road from Seetabuldi Hill at Nagpoor to Oomraoti. Manuscript, National Archives, New Delhi.
1808b Survey of a Road from Seetabuldi Hill to Oomraotee. Manuscript, National Archives, New Delhi.
n.d.a. [1806-1810] Nagpoor to Rallygong, Oomraotee, Natchengong. Mss. National Archives, New Delhi.
n.d.b. [1806-1810] Nagpoor to Amner, Bisnoor etc. Mss. National Archives, New Delhi.

Lo Cascio, E.
1981 State and Coinage in the Late Republic and Early Empire. Journal of Roman Studies 71:77-86.

Longacre, William A.
1991 Sources of Ceramic Variability Among the Kalinga of Northern Luzon. In Ceramic Ethnoarchaeology, edited by William A. Longacre. University of Arizona, Tucson.

Longacre, William, Kenneth L. Kvamme and Masashi Kobayashi
1988 Southwestern Pottery Standardization: An Ethnoarchaeological view from the Philippines. The Kiva 53(2):101-112.

Lukacs, John R.
1981 Dental Pathology and Nutritional Patterns of South Asian Megalithic Builders: The evidence from Iron Age Mahurjhari. Proceedings of the American Philosophical Society 125 (3):220-237.

Luttwak, Edward
1976 The Grand Strategy of the Roman Empire. Johns Hopkins University Press, Baltimore.

MacDowell, David W.
1991 Indian Imports of Roman Silver Coins. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 145-163. Indian Institute of Research in Numismatic Studies, Nasik.
1990 Finds of Roman Coins in South Asia: Problems of Interpretation. Ancient Ceylon 9:49-74.

Mahadevan, S. and K. Nagappan Nayar
1974 Ecology of Pearl Oyster and Chank Beds. Commercial Mollusks of India, Central Marine Fisheries Research Institute Cochin Bulletin No. 25: 106-121.

Mahalingam, T.V.
1970 Report on the Excavations in the Lower Kaveri Valley. University of Madras, Madras. (Alagarai)

Majeed, A. Abdul
1987 A Note on Korkai Excavations. Tamil Civilization 5 (1+2):73-77.

Malinowski, Bronislaw
1932[1922] Argonauts of the Western Pacific. George Routledge and Sons, London.

Margabandhu, C.
1985 Archaeology of the Satavahana Kshatrapa Times. Sundeep Prakashan, Delhi.

Margabandhu, C. and G.S. Gaur
1986-87 Sanghol Excavations 1987: Some New Evidences. Purattatva 17: 1-4.

Marten, J.T.
1912 Census of India 1911, Central Provinces and Berar. Superintendent of Government Printing, Calcutta.

Mattingly, David J.
1992 The Field Survey: Strategy, Methodology and Preliminary Results. In Leptiminus (Lamta): A Roman Port City in Tunisia, edited by D. Mattingly and N. Ben Lazreg, pp. 89-114. Journal of Roman Archaeology Supplement No. 4.

Mauss, Marcel
1990[1925] The Gift. Trans. W.D. Halls. W.W. Norton, New York.

Mayr, Ernst
1982[1942] Systematics and the Origin of Species. Columbia University Press, New York.

Maxwell-Lefroy, H.
1909 The cultivation of shellac as an agricultural product. The Agricultural Journal of India 4:258-270.

McCracken, Grant
1988 Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods and Activities. Indiana University Press, Bloomington.
1987 Clothing as Language: An Object Lesson in the Study of the Expressive Properties of Material Culture. In Material Anthropology, edited by Barrie Reynolds and Margaret A. Stott, pp. 103-128. University Press of America, Lanham MA.

McKendrick, Neil
1982a Introduction. In The Birth of a Consumer Society: The Commercialization of Eighteenth-Century England, edited by Neil McKendrick, John Brewer and J.H. Plumb, pp. 1-6. Indiana University, Bloomington.
1982b The Consumer Revolution of Eighteenth-Century England. In The Birth of a Consumer Society: The Commercialization of Eighteenth-Century England, edited by Neil McKendrick, John Brewer and J.H. Plumb, pp. 9-33. Indiana University, Bloomington.

Meher-Homji, V.M.
1989 History of Vegetation of Peninsular India. Man and Environment 13:1-10.

Mehta, J.L.
1986 Advanced Study in the History of Medieval India Vol. I: 1000-1526 A.D. Sterling Publishers, New Delhi.

Mehta, R.N.
1955 Excavations at Timbarva. M.S. University Archaeological Series No. 2, Faculty of Arts, Baroda.

Mehta, R.N. and S.N. Chowdhary
1966 Excavations at Devnimori. Department of Archaeology and Ancient HIstory, M.S. University Baroda, Baroda.

Mehta, R.N. and A.J. Patel
1967 Excavations at Shamalaji. M.S. University Archaeological Series No. 9, Baroda.

Mehta, R.N. and D.R. Shah
1968 Excavation at Nagara. M.S. University Archaeological Series No. 10, Baroda.

Mehta, R.N. and S.N. Chowdhary
1975 Excavation at Dharva. M.S. University Archaeological Series No. 12, Baroda.

Miles, Gary B.
1990 Roman and Modern Imperialism: A Reassessment. Comparative Studies in Society and History 32(4):629-659.

Miller, Barbara Stoler
1992 A Dynasty of Patrons: The Representations of Gupta Royalty in Coins and Literature. In The Powers of Art: Patronage in Indian Culture, edited by Barbara Stoler Miller, pp. 54-6. Oxford University Press, Delhi.

Miller, Daniel
1995 Consumption and Commodities. Annual Review of Anthropology 24:141-161.
1987 Material Culture and Mass Consumption. Basil Blackwell, London.
1985 Artefacts as Categories. Cambridge University Press, Cambridge.

Millon, René
1974 The Study of Urbanism at Teotihuacan, Mexico. In Mesoamerican Archaeology: New Approaches, edited by Norman Hammond, pp. 335-362. University of Texas, Austin.

Millot, Benoit
1988 Symbol, Desire and Power. Theory Culture and Society 5(4):675-694.

Mines, Mattison
1984 The Warrior Merchants: Textiles, Trade and Territory in South India. Cambridge University Press, Cambridge.

Mirashi, Vasudev Vishnu
1981 The History and Inscriptions of the Satavahanas and the Western Kshatrapas. Maharashtra State Board for Literature and Culture, Bombay.
1963 Inscriptions of the Vakatakas. Corpus Inscriptionum Indicarum volume V. Government Epigraphist for India, Ootacamund.

Mirashi, V.V. and N.R. Navlekar
1969 Kalidasa: Date, Life and Works. Popular Prakashan, Bombay.

Mitchiner, Michael
1991 Early Trade Between India and Mainland Southeast Asia, as Reflected by Coinage. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 62-83. Indian Institute of Research in Numismatic Studies, Nasik.

Mohanty, R.K. and P.S. Joshi
1996 The Megalithic Problem of Vidarbha: Retrospect and Prospect. In Spectrum of Indian Culture, S.B. Deo Felicitation Volume, ed. C. Margabandhu and K.S. Ramachandran, pp. 157-169. Agam Kala Prakashan, Delhi.

Mohanty, R.K. and S.R. Walimbe
1996 An Investigation into the Mortuary Practices of Vidarbha Megalithic Cultures. In Spectrum of Indian Culture, S.B. Deo Felicitation Volume, ed. C. Margabandhu and K.S. Ramachandran, pp. 136-149. Agam Kala Prakashan, Delhi.
1993 A Demographic approach to the Vidarbha megalithic culture. Man and Environment 18(2):93-103.

Mollison, J.
1901 Field and Garden Crops of the Bombay Presidency. Government of Bombay at Times of India Press, Bombay.

Morrison, Kathleen D.
1990 Patterns of Urban Occupation: Surface Collections at Vijarayangara. In South Asian Archaeology 1987, edited by Maurizio Taddei and Pierfrancesco Callieri, pp. 1111-1126. IsMEO, Rome.

Moses, S.T.
1942 The Fisheries of the Gujarat Coast. Journal of the Gujarat Research Society 1942:61-82.
1923 The Anatomy of the Chank (Turbinella pyrum). Madras Fisheries Bulletin 17:105-127.

Mukherjee, B.N.
1991 Trade, Traders and Media of Exchange in Pre-Gupta Vanga. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 46-51. Indian Institute of Research in Numismatic Studies, Nasik.
1973 Central and South Asian Documents on the Old Saka Era. Bharat Bharati, Varanasi.

Mukherjee, Dolly
1991 The Metrology of the Malava Coins and its Reflection on Their Economic Condition. In Coinage, Trade and the Economy, edited by Amal

Kumar Jha, pp. 28-32. Indian Institute of Research in Numismatic Studies, Nasik.

Mukherjee, Sibsankar
1994 The Social Role of a Caste Organization. The Indian Economic and Social History Review 31(1):89-100.

Mukherjee, Sudershan
1967 Agricultural Production in Vidarbha. The Deccan Geographer 5(1&2):86-97.

Mukundan, C.
1968 Molluscs in Indian Tradition and Economy. Proceedings of the Symposium on Mollusca, Cochin, January 12-16, 1968. Marine Biological Association of India, Madras.

Murty, M.L.K.
1993 Ethnohistory of Pastoralism: A Study of Kuruvas and Gollas. Studies in History new series 9(1):33-41.

Murty, M.L.K. and Günther D. Sontheimer
1981 Prehistoric Background to Pastoralism in the Southern Deccan in the Light of Oral Tradition and Cults of Some Pastoral Communities. Anthropos 75:163-84.

Nagappan Nayar, K. and S. Mahadevan
1974 Chank Fisheries and Industrial Uses of Chanks. The Commercial Mollusks of India, Central Marine Fisheries Research Institute Cochin Bulletin No. 25:122-140.
1973 Chank Resources of India. Proceedings of the Symposium on Living Resources of the Seas around India. Central Marine Fisheries Research Institute Special Publication Cochin, pp. 672-686.

Nagaswamy, R.
1970 Excavation at Korkai, District Tirunelveli. Damilica I:50-54.

Nagaswamy, R. and A. Abdul Majeed
1978 Vasavasamudram. State Department of Archaeology, Government of Tamil Nadu, Madras.

Nagayach, V.P.
1990 Buddhist Remains at Deur Kothar. Indian Journal of Buddhist Studies 2(2):40-41.

Nanavati, J.M, R.N. Mehta and S.N. Chowdhary
1971 Somnath 1956 (Monograph 1). Department of Archaeology, Gujarat State.

Narain, A.K.
1957 The Indo-Greeks. Clarendon Press, Oxford.

Narain, A.K. and T.N. Roy
1976 Excavations at Rajghat, vols. I and II. Banaras Hindu University, Varanasi.

Narain, A.K. and Purushottam Singh
1977 Excavations at Rajghat, vol. III (Small Finds). Banaras Hindu University, Varanasi.

Nath, Amarendra
n.d. Antiquities of Graeco-Roman Affinity from Adam an Inland Mart of Central India. To appear in East West.
1989-90 Archaeology of the Wardha Wainganga Divide. Puratattva 20:93-98.

Nenadic, Stana
1994 Middle-Rank Consumers and Domestic Culture in Edinburgh and Glasgow 1720-1840. Past and Present 145:122-156.

Olsen, Stephen M.
1976 Regional Social Systems: Linking Quantitative Analysis and Field Work. In Regional Systems, vol. II: Social Systems, edited by Carol A. Smith, pp. 21-61. Academic Press, New York.

Orlove, Benjamin S. and Henry J. Rutz
1989 Thinking About Consumption: A Social Economy Approach. In The Social Economy of Consumption, edited by Henry J. Rutz and Benjamin S. Orlove, pp. 1-57. University Press of America, Lanham, MA.

Orton, Nancy Pinto
1991 Red Polished Ware in Gujarat: A Catalogue of 12 Sites. Rome and India, edited by Vimala Begley and Richard Daniel De Puma, pp. 46-81. University of Wisconsin, Madison.

Parasher-Sen, Aloka
1993 Preface. In Social and Economic History of Early Deccan, edited by Aloka Parasher-Sen, pp. ix-xix. Manohar, New Delhi.
1993 Introduction - Problems of Interpretation. In Social and Economic History of Early Deccan, edited by Aloka Parasher-Sen, pp. 1-65. Manohar, New Delhi.

Parasher-Sen, Aloka (con't)
1993 Culture and Civilization. In Social and Economic History of Early Deccan, edited by Aloka Parasher-Sen, pp. 66-114. Manohar, New Delhi.

Parkin, David
1993 Nemi in the Modern World: Return of the Exotic? Man 28(1) n.s. 79-99.

Plattner, Stuart
1989a Introduction. In Economic Anthropology, edited by Stuart Plattner, pp. 1-20. Stanford University Press, Stanford.
1989b Markets and Marketplaces. In Economic Anthropology, edited by Stuart Plattner, pp. 171-208. Stanford University Press, Stanford.
1989c Economic Behavior in Markets. In Economic Anthropology, edited by Stuart Plattner, pp. 209-221. Stanford University Press, Stanford.

Plog, S., F. Plog and W. Wait
1978 Decision Making in Modern Surveys. In Advances in Archaeological Method and Theory, volume I, edited by M.B. Schiffer, pp. 383-421.

Polanyi, Karl
1975[1951] Traders and Trade. In Ancient Civilization and Trade, edited by Jeremy A. Sabloff and C.C. Lamberg-Karlovsky, pp. 133-154. University of New Mexico Press, Albuquerque.
1957 The Economy as Instituted Process. In Trade and Market in the Early Empires, edited by K. Polanyi, C.M. Arensberg, and H.W. Pearson, pp. 243-270. Free Press, New York.

Pool, Christopher A.
1992 Integrating Ceramic Production and Distribution. In Ceramic Production and Distribution: An Integrated Approach, edited by George J. Bey III and Christopher A. Pool, pp. 275-313. Westview Press, Boulder, Colorado.

Possehl, Gregory L.
1980 Indus Civilization in Saurashtra. B.R. Publishing, Delhi.

Potts, D.T.
1990 The Arabian Gulf in Antiquity, vol. 1 (From Prehistory to the Fall of the Achaemenid Empire).

Clarendon, Oxford. Vol. II (From Alexander the Great to the Coming of Islam)

Prasad, Prakash Charan
1977 Foreign Trade and Commerce in Ancient India. Abhinav Publications, New Delhi.

Preteceille, Edmond and Jean-Pierre Terrail
1985 Capitalism, Consumption and Needs. Translated by Sarah Matthews. Basil Blackwell, London.

Price, Barbara J.
1984 Competition, Productive Intensification, and Ranked Society: Speculations from Evolutionary Theory. In Warfare, Culture and the Environment, edited by R. Brian Ferguson, pp. 209-240. Academic Press, New York.

Publications and Information Directorate
1992 The Wealth of India. Raw Materials 3:Ca-Ci. Publications and Information Directorate, CSIR, New Delhi.
1985 The Wealth of India. Raw Materials vol. IA. Publications and Information Directorate, CSIR, New Delhi.
1976 Wheat in India. Publications and Information Directorate, CSIR, New Delhi.

Rajan, K.V. Soundara
1982 Motivations for Early Indian Urbanization: An Examination. In Harappan Civilization, edited by Gregory L. Possehl, pp. 69-75. Aris and Phillips, Warminster, England.

Ramachandran, K.S.
1980 Archaeology of South India: Tamil Nadu. Sundeep Prakashan, Delhi.

Ramachandran, T.N.
1951 Tamralipti (Tamluk). Artibus Asiae 14:226-239.

Raman, K.V.
1988 Excavations at Uraiyur (Tiruchirappalli) 1965-69. University of Madras, Madras.
1987 Archaeological Excavations in Kanchipuram. Tamil Civilization 5(1+2):61-72.

Ramaswamy, Vijaya
1985 The Genesis and Historical Role of the Masterweavers in South Indian Textile Production. Journal of the Economic and Social History of the Orient vol. 28, pp. 294-325.

Ramesh, K.V.
1992 On the Vakatakas and their Inscriptions. In The Age of the Vakatakas, edited by A.M. Shastri, pp. 27-32. Harman Publishing, New Delhi.

Ranade, Prabha Shastri
1990 Population Dynamics in India. Ashish Publishing House, New Delhi.

Rao, Gurty Venket
1982[1960] The pre-Satavahana and Satavahana periods. In The Early History of the Deccan, edited by G. Yazdani, pp. 65-147. Oxford, London.

Rao, Manjushri
1984 Civil Architecture as Depicted in Early Sanchi Sculptures. Prachya Pratibha (Birla Institute of Art and Music, Bhopal) 12(1-2):41-47.

Rao, S.R.
1966 Excavations at Amreli. Baroda Museum and Picture Gallery, Baroda.

Ratnagar, Shereen
1989 A Chalcolithic Village in a Famine Belt. Studies in History new series 5(2):287-302.

Ray, Himanshu Prabha
1994 The western Indian Ocean and the early maritime links of the Indian subcontinent. The Indian Economic and Social History Review 31(1):65-88.
1991 Trade in the Deccan under the Satavahanas: Numismatic Evidence. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 23-27. Indian Institute of Research in Numismatic Studies, Nasik.
1989 Early Historical Trade: An Overview. The Indian Economic and Social History Review 26(4):437-457.
1988 The Yavana Presence in Ancient India. Journal of the Economic and Social History of the Orient 31(3):311-325.
1987 Early Historical Urbanization: The Case of the Western Deccan. World Archaeology 19(1):94-104.
1986 Monastery and Guild: Commerce under the Satavahanas. Oxford University Press, Delhi.
1985 Trade in the Western Deccan under the Satavahanas. Studies in History new series 1(1): 15-35.

Ray, Sunil C.
1991 A Revised Study into the Numismatic Evidence of the Indo-Roman Trade. In Coinage, Trade and

Economy, edited by Amal Kumar Jha, pp. 138-144. Indian Institute of Research in Numismatic Studies, Nasik.

Raychuri, Hemachandra
1982[1960] The Geography of the Deccan. In The Early History of the Deccan, edited by G. Yazdani, pp. 1-63. Oriental Books, New Delhi.

Reddy, K. Thimma, M.L.K. Murty, D.R. Raju, and N. Chandramouli
1990 Excavations at Elchuru: A Preliminary Report. Man and Environment 15(1):83-91.

Redman, Charles L.
1977 The "Analytic Individual" and Prehistoric Style Variability. In The Individual in Prehistory, edited by James N. Hill and Joel Gunn, pp. 41-53. Academic Press, New York.

Redman, Charles L. and Patty Jo Watson
1970 Systematic, Intensive Surface Collections. American Antiquity 35(3):279-291.

Reese, David S.
1991 The Trade of Indo-Pacific Shells into the Mediterranean Basin and Europe. Oxford Journal of Archaeology 10(2):159-196.

Renfrew, Colin
1975 Trade as Action at a Distance: Questions of Integration and Communication. In Ancient Civilization and Trade, edited by Jeremy A. Sabloff and C.C. Lamberg-Karlovsky, pp. 3-59. University of New Mexico Press, Albuquerque.

Renfrew, Colin and John F. Cherry, eds.
1986 Peer Polity Interaction and Socio-Political Change. Cambridge University Press, Cambridge.

Rennell, James
1976[1793] Memoir of a Map of Hindoostan or the Mogul Empire, third edition. Editions Indian Indian, Calcutta.

Rice, Prudence M.
1987a Pottery Analysis. University of Chicago, Chicago.
1987b Economic Change in the Lowland Maya Late Classic Period. In Specialization, Exchange and Complex Societies, edited by Elizabeth

M. Brumfiel and Timothy K. Earle, pp. 76-85. Cambridge University Press, Cambridge.

1984 The Archaeological Study of Specialized Pottery Production: Some Aspects of Method and Theory. In Pots and Potters: Current Approaches in Ceramic Archaeology, edited by Prudence M. Rice, pp. 45-54. Institute of Archaeology Monograph XXIV, University of California Los Angeles, Los Angeles.

1981 Evolution of Specialized Pottery Production: A Trial Model. Current Anthropology 22(3):219-240.

Rodgers, W.A.

1991 Environmental Change and the Evolution of Pastoralism in South Asia: A Discussion. Studies in History 7(2):195-204.

Rogers, J. Daniel

1990 Objects of Change. Smithsonian Press, Washington D.C.

Rotstein, Abraham

1970 Karl Polanyi's Concept of Non-Market Trade. Journal of Economic History 30:117-126.

Roy, Sudhir Chandra

1921 A Preliminary Classification of the Wild Rices of the Central Provinces and Berar. The Agricultural Journal of India 16:365-380.

Runnels, Curtis and Tjeerd H. van Andel

1987 Beyond the Acropolis: the Archaeology of the Greek Countryside. Stanford University Press, Stanford.

Russell, R.V.

1906 Central Provinces District Gazetteers, Wardha District. Volume A Descriptive. Pioneer Press, Allahabad.

Rye, Owen S.

1981 Pottery Technology. Taraxacum, Washington D.C.

Sackett, James R.

1985 Style and Ethnicity in the Kalihari: A Reply to Wiessner. American Antiquity 50:154-159.

Sahlins, Marshall

1972 Stone Age Economics. Aldine, Chicago.

1963 Poor Man, Rich Man, Big-Man, Chief: Political Types in Melanesia and Polynesia. Comparative Studies in Society and History 5:285-303.

Sanders, W.T., J.R. Parsons, and R.S. Santley
1979 The Basin of Mexico. Academic Press, New York.

Sankalia, H.D. and S.B. Deo
1955 Report on the Excavations at Nasik and Jorwe 1950-51. Deccan College Monograph Series No. 13, Poona.

Sankalia, H.D., S.B. Deo and Z.D. Ansari
1969 Excavations at Ahar (Tambavati). Deccan College Postgraduate and Research Institute, Pune.

Sankalia, H.D, S.B. Deo, Z.D. Ansari, and S. Ehrhardt
1960 From History to Prehistory at Nevasa (1954-56). Poona.

Sankalia, H.D. and M.G. Dikshit
1952 Excavations at Brahmapuri (Kolhapur) 1945-46. Deccan College Monograph series 15, Deccan College Postgraduate and Research Institute, Poona.

Sarkar, H.
1987 Emergence of Urban Centres in Early Historical Andhradesa. In Archaeology and History, edited by B.M. Pande and B.D Chattopadhyaya, pp. 631-641. Agam Kala Prakashan, Delhi.

Sarma, I.K.
1980 Coinage of the Satavahana Empire, New Delhi.

Sastri, K.A. Nilakanta
1978 South India and Southeast Asia: Studies in their History and Culture. Mysore: Geetha Book House.

Sastri, T.V.G., M. Kasturi Bai, J. Vara Prasada Rao
1984 Veerapuram: A type site for cultural study in the Krisna valley. Birla Archaeological and Cultural Research Institute, Hyderabad.

Sastry, V.V. Krisna
1979 Keesara - A Capital of Visnukundins (?). Andhra Pradesh Journal of Archaeology (Director of Archaeology and Museums, Government of Andhra Pradesh, Hyderabad) 1(1):97-103.

Schlereth, Thomas J.
1990 Cultural History and Material Culture. UMI Research Press, Ann Arbor.

Schneider, Jane
1977 Was There a Precapitalist World-System? Journal of Peasant Studies 6(1):20-29.

Schreiber, Katharina J.
1992 Wari Imperialism in Middle Horizon Peru. UMMA Anthropological Papers 87. University of Michigan, Ann Arbor.

Season and Crop Report
1927-28 Season and Crop Report of the Central Provinces and Berar for 1927-28.
1928-29 Season and Crop Report of the Central Provinces and Berar for 1928-29.
1929-30 Season and Crop Report of the Central Provinces and Berar for 1929-30.

Seshadri, M.
1971 Report on the Excavations at T. Narasipur. Government of Mysore, Mysore.

Shackleton, Nicholas and Colin Renfrew
1970 Neolithic Trade Routes Re-aligned by Oxygen Isotope Analysis. Nature 228:1062-1065.

Sharma, G.R.
1960 The Excavations at Kausambi (1957-59). Institute of Archaeology, Allahabad University Publications No. 1, Allahabad.

Sharma, I.K.
1992 Some Unique Representations of Siva of the Vakataka Period. In Age of the Vakatakas, edited by A.M. Shastri, pp. 219-224. Harman Publishing, New Delhi.
1990-91 Ceramics and Maritime Routes of India: New Evidence. Purattatva 21:37-42.

Sharma, R.A.
1991 Technology and Material Life of Central India (From Chalcolithic Period to Mauryan Period). Agam Kala Prakashan, Delhi.

Sharma, R.S.
1991 Urbanism in Early Historic India. In The City in Indian History, edited by Indu Banga, pp. 9-18. South Asian Publications, Columbia, Missouri.

Shastri, Ajay Mitra
1992a New Vakataka Inscriptions. In Age of the Vakatakas, edited by A.M. Shastri, pp. 227-268. Harman Publishing, New Delhi.
1992b Vakataka Coins. In Age of the Vakatakas, edited by A.M. Shastri, pp. 285-294. Harman Publishing, New Delhi.

Shaw, F.J.F. and Rakhal Das Bose
1928 Studies in Indian pulses. Memoirs of the Department of Agriculture in India (Botanical Series) 16(6):159-189.

Sherwani, H.K.
1977 Deccan: the Regional of Coexistence and Integration. Medieval India IV: 139-150.

Sidebotham, Steven E.
1989 Ports of the Red Sea and the Arabia-India trade. In The Eastern Frontier of the Roman Empire, edited by D.H. French and C.S. Lightfoot, pp. 485-513. British Archaeological Reports International Series 553, Oxford.

Singh, Meera
1978 Medieval History of India. Vikas Publishing, New Delhi.

Singh, Rana P.B. and Gohan Shyam Singh
1978 Pattern and Prospect of Service Centres in Spatial Context: Case of the Bastar District. In Transformation of Rural Habitat in Indian Perspective, a Geographic Dimension, edited by R.L. Singh and Rana P.B. Singh, pp. 95-107. National Geographic Society of India, Varanasi.

Singh, Shiw Mangal
1965 The Stability Theory in Rural Central Place Development. The National Geographical Journal of India. 11(1):13-21.

Sinopoli, Carla M.
1991 Approaches to Archaeological Ceramics. Plenum Press, New York.
1990 The Ceramics of the Noblemen's Quarter of Vijayanagara. In South Asian Archaeology 1987, edited by Maurizio Taddei and Pierfrancesco Callieri, pp. 1127-1150. IsMEO, Rome.

Sinopoli, Carla M. and Kathleen D. Morrison
in press The Vijayanagara Metropolitan Survey: the 1992 season. Vijayanagara progress of research, edited by D.V. Devaraj and C.S. Patil. Department of Archaeology and Museums, Mysore.

Skinner, G. William
1964 Marketing and Social Structure in Rural China, Part I. The Journal of Asian Studies 24(1):3-43.
1965 Marketing and Social Structure in Rural China,

Part II. The Journal of Asian Studies 24(2):195-228.

Smith, Adam
1976[1776] An inquiry into the Nature and Causes of the Wealth of Nations. Clarendon, Oxford.

Smith, Carol A.
1976a Analyzing Regional Social Systems. In Regional Systems, vol. II: Social Systems, edited by Carol A. Smith, pp. 3-20. Academic Press, New York.
1976b Exchange Systems and the Spatial Distribution of Elites: The Organization of Stratification in Agrarian Societies. In Regional Systems, vol. II: Social Systems, edited by Carol A. Smith, pp. 309-374. Academic Press, New York.

Smith, M. Estellie
1991 The ABCs of Political Economy. In Early State Economics, edited by Henri J.M. Claessen and Pieter van de Velde, pp. 31-73. Transaction Publishers, New Brunswick N.J.
1989 The Informal Economy. In Economic Anthropology, edited by Stuart Plattner, pp. 292-317. Stanford University Press, Stanford.

Smith, M.G.
1972 Compexity, Size and Urbanization. In Man, Settlement and Urbanism, edited by Peter J. Ucko, Ruth Tringham and G.W. Dimbleby, pp. 567-574. Schenkman, Cambridge Mass.

Smith, Monica L.
in press Excavations at Site 251, Leptiminus, Tunisia. To appear in the Journal of Roman Archaeology, supplemental series.
1996 Regional Exchange in the Central Indian Subcontinent in the Early Centuries A.D.: Stable Isotopes and Marine-shell Provenience. Paper presented at the Society for American Archaeology meetings, New Orleans.

Snead, James E.
1992 Imperial Infrastructure and the Inka State Storage System. In Storage in the Inka Empire, edited by Terry Y. Levine, pp. 62-106. University of Oklahoma Press, Norman.

Sonawane, V.H.
1992 Fresh Light on the Specialized Crafts of the Harappans in Gujarat. The Eastern Anthropologist 45(1,2): 155-172.

Spaulding, Albert C.
1953 Statistical Techniques for the Discovery of Artifact Types. American Antiquity 28(4):305-313.

Spink, Walter M.
1992 The Achievement of Ajanta. In Age of the Vakatakas, edited by A.M. Shastri, pp. 177-202. Harman Publishing, New Delhi.

Srinivasan, K.R.
1987 Archaeology of Tamilnadu and Kerala Accomplishments and Prospects. Tamil Civilization 5 (1&2): 10-29.

Stark, Barbara L
1992 Ceramic Production in Prehistoric La Mixtequilla, South-Central Veracruz. In Ceramic Production and Distribution: An Integrated Approach, edited by George J. Bey III and Christopher A. Pool, pp. 175-204. Westview Press, Boulder, Colorado.
1985 Archaeological Identification of Pottery-Production Locations: Ethnoarchaeological and Archaeological Data in Mesoamerica. In Decoding Prehistoric Ceramics, edited by Ben A. Nelson, pp. 158-194. Southern Illinois University Press, Carbondale.

Stein, Burton
1975 The State and Agrarian Order in Medieval South India: A Historiographical Critique. In Essays on South India, edited by Burton Stein. Hawaii: University Press of Hawaii, pp. 64-91.
1960 The Economic Function of a Medieval South Indian Temple. Journal of Asian Studies 19:2, pp. 163-176.

Stein, Gil J., Reinhard Bernbeck, Cheryl Coursey, Augusta McMahon, Naomi F. Miller, Adnan Misir, Jeffrey Nicola, Holly Pittman, Susan Pollock and Henry Wright
1996 Uruk Colonies and Anatolian Communities: An Interim Report on the 1992-93 Excavations at Hacinebi, Turkey. American Journal of Archaeology 100(2):205-260.

Strange, James F.
1989 Beyond Socio-Economics: Some Reactions to 'Morphology, Composition and Stratigraphy'. In

Analysis and Publication of Ceramics: The Computer Data-base in Archaeology, edited by Jeffrey A. Blakely and W.J. Bennett, Jr., pp. 23-30. British Archaeological Reports International Series 551, Oxford.

Subbarao, Bendapudi
1953 Baroda Through the Ages. M.S. University Archaeological Series I, Faculty of Arts, M.S. University Baroda, Baroda.

Subbarayalu, Y.
1984 Vallam excavations. Tamil Civilization 2(4):9-98.

Subramanian, N.
1966 Sangam polity. Asia Publishing, Bombay.

Subramanyam, R.
1974 Kanchipuram excavations. Journal of the Andhra Historical Research Society 34:23-34.

Tamaskar, B.G.
1985 Stability of Periodic Market-places and Marketing System on the Arvi Upland. The Deccan Geographer 23: 55-70.

Terrenato, Nicola and Albert J. Ammerman
1996 Visibility and Site Recovery in the Cecina Valley Survey, Italy. Journal of Field Archaeology 23(1):91-109.

Thapar, B.K.
1957 Maski 1954: A Chalcolithic Site of the Southern Deccan. Ancient India 13:4-142.

Thapar, Romila
1992 Patronage and the Community. In The Powers of Art: Patronage in Indian Culture, edited by Barbara Stoler Miller, pp. 19-34. Oxford University Press, Delhi.
1966 A History of India, vol. I. Penguin, London
1961 Asoka and the Decline of the Mauryas. Oxford University Press, London.

Thomas
1782 Journey from Naugpoor to Cuttack January 1782. Mss. National Archives, New Delhi.

Thomas, David Hurst
1978 The Awful Truth about Statistics in Archaeology. American Antiquity 43(2):231-244.

Thomas, P.K.
1992a Horse Remains from Raipur. In Megalithic Raipur (1985-1990), by G.B. Deglurkar and Gouri P. Lad, pp. 133-136. Deccan College and Post-Graduate Institute, Pune.
1992b The Faunal Assemblage and Subsistence Strategies at Tuljapur Garhi. Man and Environment 17(2):71-74.
1992c Faunal Background of the Iron Age Culture of Maharashtra. Man and Environment 17(2):75-79.
1993 Faunal Remains from the Megalithic Habitation Site at Bhagimohari, Vidarbha, Maharashtra. Man and Environment 18(2):105-118.

Thornton, Edward
1984[1858] A Gazetteer of the Territories under the Government of the East India Company and of the Native States on the Continent of India. Neeraj Publishing, Delhi.

Trautmann, Thomas R.
1981 Dravidian Kinship. Cambridge University Press, New York.

Trigger, Bruce G.
1978 Ethnohistory and Archaeology. Ontario Archaeology 30:17-24.

Tripathy, Vibha and Amit Tripathy
1994 Iron Working in Ancient India: An Ethnoarchaeological Study. In From Sumer to Meluhha: Contributions to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., edited by Jonathan Mark Kenoyer, pp. 241-251. Wisconsin Archaeological Reports 3. Prehistory Press, Madison, WI.

T.T. Maps and Publications
1992 Maharashtra. T.T. Maps and Publications, Madras.

Turner, Terence S.
1980 The Social Skin. In Not Work Alone, edited by Jeremy Cherfas and Roger Lewin, pp. 112-140. Temple Smith, London.

Van der Leeuw, Sander
1984 Pottery Manufacture: Some Complications for the Study of Trade. In Pots and Potters: Current Approaches to Ceramic Archaeology, edited by Prudence M. Rice, pp. 55-69. Institute of Archaeology Monograph 24, UCLA, Los Angeles.

Vidale, Massimo
1990 On the Structure and the Relative Chronology of an Harappan Industrial Site. South Asian Archaeology 1987, edited by Maurizio Taddei and Pierfrancesco Callieri, pp. 203-244. IsMEO, Rome.

Vishnu-Mittre
1966 Kaundinyapur Plant Economy in Protohistoric and Historic Times. The Palaeobotanist (Lucknow) 15(1&2): 152-156.

Vishnu-Mittre and H.P. Gupta
1968-69 Plant Remains from Ancient Bhatkuli, District Amraoti, Maharashtra. Puratattva 2:21-22.

Vishnu-Mittre, U. Prakash and N. Awasthi
1971 Ancient Plant Economy at Ter, Maharashtra. Geophytology 1(2):170-177.

Vogel, Hans Ulrich
1993 Cowry Trade and Its Role in the Economy of Yünnan from the Ninth to the mid-Seventeenth Century, part I. Journal of the Economic and Social History of the Orient 36(3): 211-252.

Walker, Lucy
1984 Survey of a Settlement: A Strategy for the Etruscan site at Doganella in the Albegna Valley. In Archaeology from the Ploughsoil, edited by Colin Haselgrove, Martin Millett and Ian Smith, pp. 87-94. Department of Archaeology and Prehistory, Sheffield.

Walker, Michael J. and S. Santoso
1977-78 Romano-Indian Rouletted Pottery in Indonesia. Puratattva 9:104-108.

Wallerstein, Immanuel
1974 The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century. Academic Press, San Diego.

Warde, Alan
1990 Introduction to the Sociology of Consumption. Sociology 24(1):1-4.

Wayman, Alex and Elizabeth Rosen
1990 The Rise of Mahayana Buddhism and Inscriptional Evidence at Nagarjunakonda. Indian Journal of Buddhist Studies 2(1): 49-65.

Wattenmaker, Patricia
1994 State Formation and the Organization of Domestic Craft Production at Third-Millennium B.C. Kurban Hoyuk, Southeast Turkey. In Archaeological Views from the Countryside, edited by Glenn M. Schwartz ad Steven E. Falconer, pp. 109-120. Smithsonian, Washington D.C.

Welch, David J.
1989 Late Prehistoric and Early Historic Exchange Patterns in the Phimai Region, Thailand. Journal of Southeast Asian Studies 20(1):11-26.

Whallon, Robert
1983 Methods of Controlled Surface Collection in Archaeological Survey. In Archaeological Survey of the Mediterranean Area, edited by Donald R. Keller and David W. Rupp, pp. 73-83. British Archaeological Reports International Series 155, Oxford.
1979 An Archaeological Survey of the Keban Reservoir Area of East-central Turkey. Memoirs of the Museum of Anthropology, University of Michigan No. 11. Ann Arbor.

Wheatley, Paul
1972 The Concept of Urbanism. In Man, Settlement and Urbanism, edited by Peter J. Ucko, Ruth Tringham and G.W. Dimbleby, pp. 601-637. Schenkman, Cambridge Mass.

Wheeler, R.E.M.
1946 Brahmagiri and Chandravalli 1947: Megalithic and Other Cultures in the Chitaldurg District Mysore State. Ancient India 4:180-310.
1946 Arikamedu: An Indo-Roman Trading-station on the East Coast of India. Ancient India 2:17-124.

Whitecotton, Joseph W.
1992 Culture and Exchange in Postclassic Oaxaca: A World-System Perspective. In Resources, Power, and Interregional Interaction, pp. 51-74. Plenum Press, New York.

Wicks, Robert S.
1991 Money Use and the Control of Trade in Early Southeast Asia. In Coinage, Trade and Economy, edited by Amal Kumar Jha, pp. 84-98. Indian Institute of Research in Numismatic Studies, Nasik.

Wiessner, Polly
1983 Style and Social Information in Kalahari San

Projectile points. American Antiquity 49:253-276.

Wilk, Richard
1990 Consumer Goods as Dialogue about Development. Culture and History 7: 79-100.

Wilkinson, T.J.
1982 The Development of Settlement in the North Jazira Region between the Seventh and First Millennium B.C. Iraq 52:49-62.

Willey, Gordon R.
1953 Prehistoric Settlement Patterns in the Viru Valley, Peru. U.S. Government Printing Office, Washington, D.C.

Willey, Gordon R. and Jeremy A. Sabloff
1980 A History of American Archaeology. W.H. Freeman, San Francisco.

Willis, Janice D.
1992 The Collective and Popular Basis of Early Buddhist Patronage: Sacred Monuments, 100 BC - AD 250. In The Powers of Art: Patronage in Indian Culture, edited by Barbara Stoler Miller, pp. 46-53. Oxford University Press, Delhi.

Wilson, Samuel M. and J. Daniel Rogers
1993 Historical Dynamics in the Contact Era. In Ethnohistory and Archaeology, edited by J. Daniel Rogers and Samuel M. Wilson, pp. 3-18. Plenum Press, New York.

Wobst, H. Martin
1977 Stylistic Behavior and Information Exchange. In For the Director: Research Essays in Honor of James B. Griffin, edited by Charles E. Cleland, pp. 317-342. Museum of Anthropology Anthropological Paper 61, University of Michigan, Ann Arbor.

Wright, Henry T.
1984 Pre-state Political Formations. In The Evolution of Complex Societies: The Harry Hoijer Lectures for 1982, edited by Timothy Earle, pp. . Undena Press, Malibu, California.
1972 A Consideration of Interregional Exchange in Greater Mesopotamia: 4000-3000 B.C. In Social Exchange and Interaction, edited by Edwin N. Wilmsen, pp. 95-105. University of Michigan Museum of Anthropology, Anthropological Papers No. 46, Ann Arbor.

Wright, James C. _et al._
1990 The Nemea Valley Archaeological Project: A preliminary Report. _Hesperia_ 59(4):579-659.

Yarlagadda, Tejaswini
1993 Social Groups and Economic Change 7th-13th Century A.D. In _Social and Economic History of Early Deccan_, edited by Aloka Parasher-Sen, pp. 158-239. Manohar, New Delhi.